

If You Need Rock Data Then You Measure Rocks at NTS

More than a mile into G-tunnel at the Nevada Test Site past drifts where underground nuclear weapons tests have been conducted over the years, Roger Zimmerman (6313) has partially isolated a huge hunk of volcanic welded tuff. The rock is exposed at its surface (on the floor of the tunnel) but it has been neatly sliced on four sides into a two-metre square. The bottom part of the block is still attached to the rock foundation.

Into the slots that outline the square, Roger, Bob Schuch (6313), and contractors have inserted hydraulically driven flat-jacks capable of exerting loads of more than 10 million pounds. At the same time, electric heaters are coupled to the rock to raise its temperature to 250°C. The idea is to simulate conditions in the rock that would be brought about by the burial of high level radioactive wastes in volcanic welded tuff. Extensive instrumentation records the shifting dimensions of the rock — the strains, pressures and temperatures.

An important part of this heated block experiment is to measure changes in water content of the block over the various temperatures. The effects of temperature and pressure load on water flow through fractures in the rock are also measured. The study is only part of the effort by Division 6313 to characterize welded tuff for use as a possible radioactive waste depository.

Near G-tunnel at NTS is Yucca Mountain, containing the same kind of welded tuff formation that was laid down in the same geologic time period as that in G-tunnel. Yucca Mountain is under active consideration as a depository for high-level radioactive waste. It is one of several sites being evaluated by DOE as possible loca-

(Continued on Page Four)



HEATED BLOCK EXPERIMENT on the floor of G-tunnel at NTS has been neatly sliced on four sides for insertion of flatjacks. Maze of instrumentation on its surface measures stress, strain, pressures, temperatures, and water flow. Overlying boards are walkways to permit technicians to work on the experiment without disturbing wiring or instruments.



LAB NEWS

VOL. 36 NO. 25 SANDIA NATIONAL LABORATORIES DECEMBER 7, 1984

Conductive Polymer May Lead to Lightweight Batteries

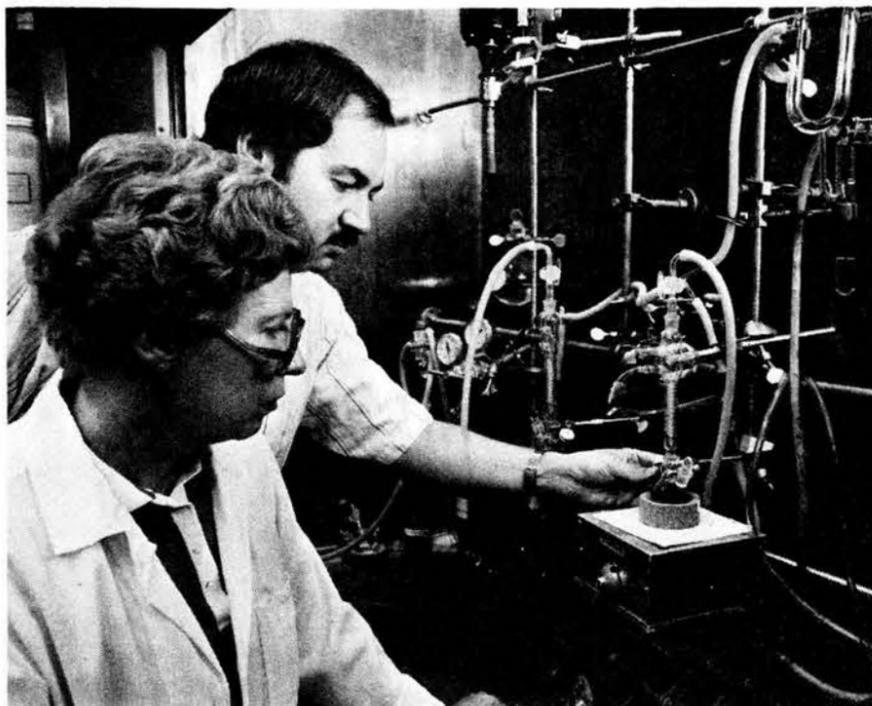
Plastics and plastic-like materials don't conduct; in fact, they're used for insulation. But a new plastic-like material that can be dissolved or melted may help open the doors to a variety of new conductive polymers, perhaps even a lightweight battery.

The material, a polymer abbreviated as PTMSA, has an unprecedented property discovered by John Zeigler of Chemistry of Organic Materials Division 1811: unlike other conductive polymers, it can be easily converted into a wide range of new polymers that could conduct electricity and that might have other highly favorable properties. These new, potentially conductive, polymers — some of them never before known — are difficult or impossible to make by any other method.

"PTMSA is the first organic polymer that can serve as a versatile precursor to other yet unknown conductive polymers," says John. "It provides a means of rapidly and systematically preparing and evaluating the properties of certain types of new conductive polymers."

John announced his results at the 188th national meeting of the American Chemical Society Aug. 29 in Philadelphia.

Most plastics are extremely poor con-



IN THE LAB John Zeigler and Linda McLaughlin (both 1811) observe a chemical modification that will more precisely define the microstructure of PTMSA, a new polymer with great promise as a precursor to other conductive polymers.

ductors of electricity. Recently, however, chemists have made plastic-like materials — conductive polymers — that conduct electricity almost as well as copper does. "These conductive plastics are exciting because they may ultimately replace the heavy materials now used in batteries," says John. "Plastic batteries would be

much lighter and could provide more power for a given weight of battery."

According to Roger Clough (current 1811 supervisor) and Larry Harrah (former 1811 supervisor), many investigators think that some organic — plastic-like — batteries may also have long shelf lives. Unlike

(Continued on Page Four)

Antojitos

Here's the Beef A popular fast food chain is now advertising that it has served over 50 billion hamburgers. Given a US population of some 220 million, that means that--on the average--each of us has been served more than 227 burgers! Sort of makes you wonder how many have actually been eaten, doesn't it? I've also heard a rumor that 10 percent of the cattle raised in this country end up in the same chain. But that may be a bum steer. Or even a lot of bull. Either way, the statistics leave me cowed, certainly not in the mood for hamburger. (Maybe some coffee though--decaffeinated, please.) Time for an udder subject; I think I've milked this one totally. Cud you agree? Do you want to ruminate on it? (If heifer you've wanted to finish a paragraph, it's probably this one. No? My mistake.)

* * *

A Triple Reminds me of the successful farmer who, upon his demise, left his property to his three sons. One inherited the hogs, one the sheep, and the third the cattle (probably fated for the fast-food franchise folks). The three agreed that they wanted a name for their well diversified farm, but they couldn't agree on an appropriate one. Their mother thought a moment and said, "Call it The Prism." Why The Prism, she was asked. "Simple," she replied, "it's where the sons raise meat. (She was probably a physicist moonlighting as a mother.)

●BH

* * *

Murphy's Laws of Demographics--

1. The Law of Thermo-Demographics: Bodies are attracted by hot places and repelled by cold ones.
2. The Law of Demographic Directionality: A body that has headed West tends to remain at West.
3. The Law of Supply-Side Senility: The elderly population grows in direct proportion to increases in Social Security benefits.
4. The Law of Bio-Demographics: Bodies tend to reproduce themselves in direct proportion to the availability of two-bedroom townhouses.
5. The Flickertail State Corollary: All things being equal, North Dakota will always lose population. (*Psychology Today*, 3/82)

* * *

Huyendo del toro, cayó en el arroyo. (Spanish: While running from the bull, he fell into the stream, or "Out of the frying pan into the fire.")

Congratulations

Todd (3545) and Carol Schimke, a son, Logan, Nov. 14.

Renee (2631) and Brian Philipbar, a son, Brad Montgomery, Sept. 21.

Debbie Sarracino (3141) and Patrick Leon, married in Paguete, N.M., Nov. 17.

Paul (7522) and Susan Romero, a son, David Luis, Nov. 9.

LAB NEWS

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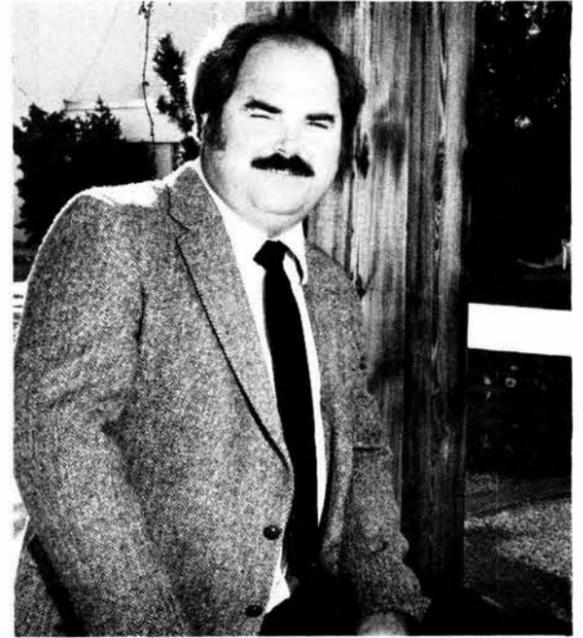
Retirees Too

Good News Again This Year

Premiums for the Second Supplemental Group Term Life Insurance Plan will be waived for the months of January through April 1985 for all coverages (one time and additional) with coverage remaining in force. This waiver of premiums applies only to employees and retirees who were plan participants before May 1, 1984.

This waiver of premiums is a result of favorable claims experience during the policy year that ended last April; there is no assurance that an additional waiver will occur in the future.

The first waiver of deductions for employees will be reflected in the Dec. 20 payroll for weekly paid employees and Dec. 6 for biweekly paid employees. The first waiver of deductions for retirees will be reflected in the Jan. 1 pension payment.



Supervisory Appointment

JOE HARRIS to supervisor of Communications and Networking Division 8234, effective Nov. 16.

He joined the Applied Physics Division at Sandia Albuquerque in 1976, working primarily in the neutron generator program. Later he moved to the Special Applications Division and concentrated on uranium logging.

His education includes a BS in EE from Lamar Tech in Beaumont, Texas, an MS in electrical sciences and a PhD in applied physics, both from Caltech. Joe did post-doctoral work in the materials research laboratory at the University of Illinois before coming to Sandia.

He's a member of the American Vacuum Society, and he enjoys skiing, hiking, and backpacking.

Congratulations

Al Elsea (8274) and Grace Rose, married in Napa, Nov. 17.

Terri Goin (8150/8240) and Bob Czapinski (8025), married in Pleasanton, Nov. 10.

Retiring



Rudy Grund (8257), Dick Clarkson (8272), Len Bedinger (8254)

Studies Seek to Unlock Secrets of Engine Knock

"Knock, knock."

"Who's there?"

The answer you *don't* want is "Your engine." That's because knock — a loud clanking noise caused by abnormal fuel ignition and often heard in gasoline engines under high load acceleration — can decrease engine efficiency and reduce power output. It's also hard on your engine: it overstresses components so that reliability suffers.

Researchers in Sandia Livermore's Combustion Research Facility and an LLNL staffer are piecing together a complex puzzle that will help them better understand knock. The research program uses advanced laser diagnostic and gas sampling techniques to investigate the chemical processes that cause the phenomenon.

"A better understanding of the processes that control knock should permit industry to design engines, fuels, or fuel additives that could significantly reduce or eliminate this abnormal combustion," says Mike Dyer, supervisor of Combustion Applications Division 8362.

"Knock is currently the major technical limitation on an engine's compression ratio," Mike says. "Higher compression ratios would permit increased thermal efficiency, which translates into increased fuel mileage, and increased torque, which would mean more spirited performance. Unfortunately, high compression ratios also promote knock because of increased combustion chamber temperatures."

(Compression ratio is a comparison of the volume in an engine's cylinder before the compression stroke with the volume in the cylinder after the compression stroke. The engines in most late-model, gasoline-powered automobiles have compression ratios in the neighborhood of 8 or 9 to 1.)

Basically, the research involves operating the CRF's special research engine so that it knocks, then gathering details about the many chemical reactions that occur in the moments leading up to knock. These data are used to verify a complex LLNL computer model that describes engine combustion. This chemical kinetic model, being developed by LLNL staff member Charles Westbrook, identifies more than 200 chemical reactions that occur and almost 100 different species of gases that are present (although most appear for only a very short time) before and during fuel combustion.

Knock results from spontaneous ignition of the fuel-air mixture as it's heated by compression in the combustion chamber. Under proper operating conditions, ignition of this mixture starts at the spark plug and a definite flame front travels rapidly through the charge.

However, under knocking conditions, normal flame propagation cannot progress to completion. What happens is that suddenly the remainder of the fuel-air charge — called the end gas — ignites spontaneously (autoignition), causing a sharp pressure rise. This phenomenon produces a heavy pressure wave that strikes the engine components with



hammer-like blows and causes them to vibrate audibly. The momentary pressure far exceeds that for which the engine was designed and can lead to overheating and premature aging.

The Sandia/LLNL collaboration has so far identified important intermediate species that may be the cause of premature autoignition.

The CRF's one-cylinder research engine, used for a wide variety of combustion studies, has a pancake-shaped combustion chamber with radially actuated valves. This design allows for a window at the top of the engine so combustion can be photographed with special high-speed cameras. Small ports on opposite sides of the engine permit entrance and exit of laser beams used to identify combustion chamber temperatures and the various chemical species present at different times during combustion.

Also, the window can be removed and a gas sampling assembly substituted in its place. With this device, a fast-acting probe samples specific zones of the combustion chamber.

"A major accomplishment to date has been our ability to control experiments in such a way that combustion chamber conditions are reliably repeated," says Bob Green (8362), lead investigator for the project. "This is important because we must ensure that autoignition occurs at the same time and in the same place in the combustion chamber during every combustion cycle."

For the knock studies, the CRF's experimental research engine uses four spark plugs spaced equidistant on the combustion chamber wall along with a shrouded intake valve that imparts a high degree of swirl to the homogeneously mixed fuel-air charge. The spark plugs fire simultaneously, initiating a normal burn at four locations. Initially, the flames propagate away from each spark plug in a swirling pattern toward the center of the chamber. However, as temperatures and pressures of the end gas (concentrated in the center of the chamber because of the four-spark plug arrangement and the test engine's high swirl capability) increase, the end gas suddenly autoignites.

Bob points out that autoignition can occur at a number of locations in a combustion chamber. For instance, other studies indicate that it is common at engine "hot spots" such as deposits on the surface of cylinder walls. "However," he says, "we believe that the low-temperature chemistry occurring just before autoignition will be



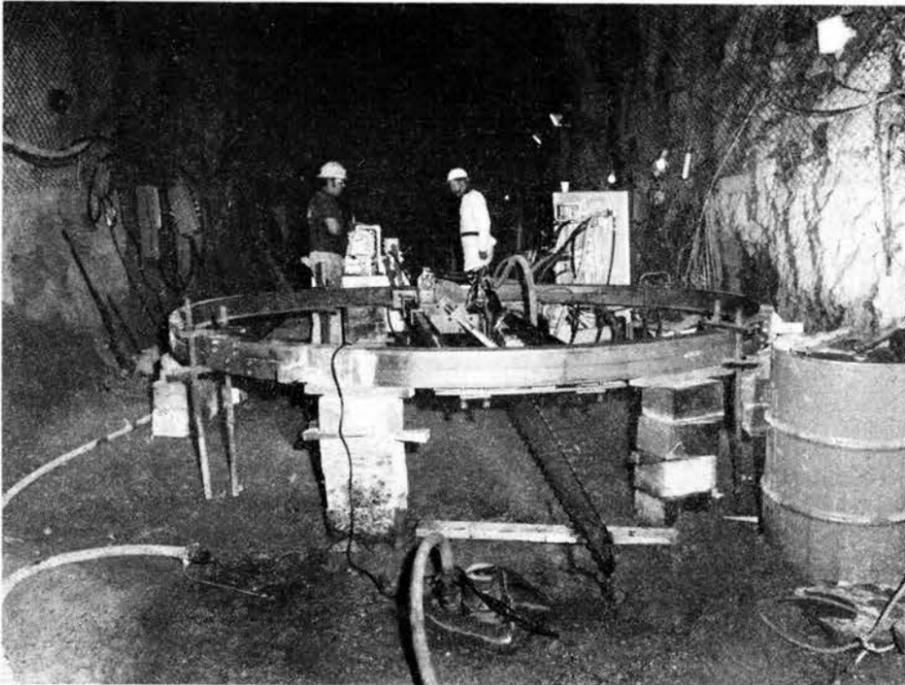
BOB GREEN (8362; right) shows off a single-cylinder research engine to LLNL staff member Charles Westbrook. The two are collaborating on engine knock experiments: Sandia's *in situ* engine measurements are being used to verify the detailed chemical kinetic model of knock that Charles is developing.

the same for these different classes of autoignition phenomena. It is, however, much easier to control and study homogeneous autoignition of end gases than other types of autoignition."

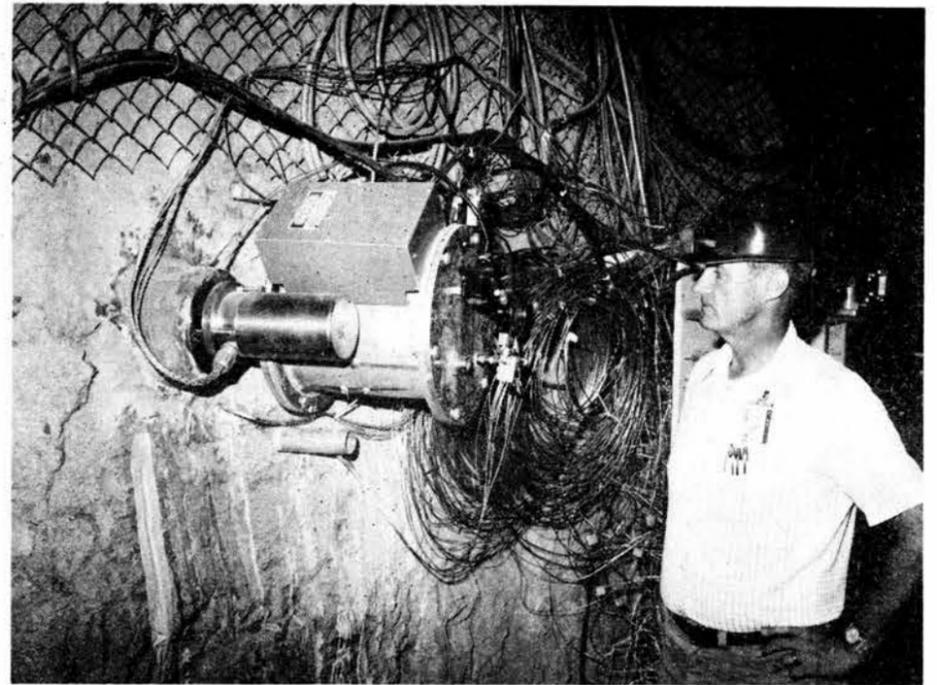
The Sandians are using three fuels for the experiments — butane, isobutane, and propane. "They are the simplest fuels we can make knock in a repeatable fashion, but the most complex fuels that can be usefully analyzed in Lawrence Livermore's computer model," Bob says.

Take Note

Joe Farmer (8313) received the Joffe Award for the best paper at the 11th World Congress on Metal Finishing, Interfinish '84, at Jerusalem, Israel. The award, which included a cash prize of \$1250, "helped gain Sandia an admirable international reputation in plating and electromechanical research," according to the conference summary report. The title of the paper, co-authored with Herman Johnson (also 8313), was "Effect of Rhodamine-B and Saccharin on the Electric Double Layer During Electrodeposition on Platinum Studied by AC-Cyclic Voltammetry."



HUGE CHAIN SAW with diamond tips and stabilizing ring was developed for cutting slots in the welded tuff of G-tunnel. The saw makes possible the pressurized slot experiment.



SMALL DIAMETER heater experiment coupled to wall of G-tunnel at NTS is inspected by Roger Zimmerman (6313). The experiment will determine if temperatures in the rock resulting from radioactive waste storage can be accurately predicted.

Continued from Page One

Rock Mechanics Study at NTS

tions for a repository. Seven of the other potential sites are in salt formations in Louisiana, Mississippi, Texas, and Utah. One potential site is a basalt formation near Hanford, Washington.

In addition to the heated block experiment in G-tunnel, other field experiments are underway that contribute to a basic understanding of temperature, stress, and water movement in the rock. Departments 7110, 7120, 7130, and 6250 are supporting the experiments.

Small-diameter heater experiments measure the temperature distributions around the heater to determine if temperatures in the rock resulting from waste storage can be accurately predicted. Migration of water and vapor into the annulus around the heater is also measured to determine the environment that will exist near a canister of heat-producing nuclear waste. This information will be used by engineers at LLNL to design the waste canisters.

Pressurized slot experiments will measure the movement of the rock resulting from pressure loading on the borders of

a thin slot. The stiffness (modulus) of the rock determined in this test is a valuable input used to predict the stresses created by temperature increases and excavation. Mining effects and strength evaluation experiments are planned for FY85.

In addition to field tests, laboratory studies and mathematical modeling of the behavior are ongoing projects in Joe Tiller's Nevada Nuclear Waste Storage Investigations Geotechnical Projects Division 6313. Modeling allows prediction of behavior and performance of various nuclear waste repository designs under conditions that might prevail at the Nevada Test Site.

The measurements and data gathered in both the lab and field experiments become part of a comprehensive rock mechanics data base that will be used for repository design, waste package design, performance assessment, and licensing considerations by the NRC. The experience will also guide more extensive experiments planned for FY86 in an exploratory shaft to be excavated in Yucca Mountain.

Continued from Page One

Conductive Polymers

lead/acid batteries, organic batteries should not deteriorate when not in use.

In addition, PTMSA and polymers of similar structure have been found by an independent group of Japanese scientists to be useful for fabrication of membranes that can separate gases (oxygen from nitrogen, for example) and may ultimately make such processes cheaper.

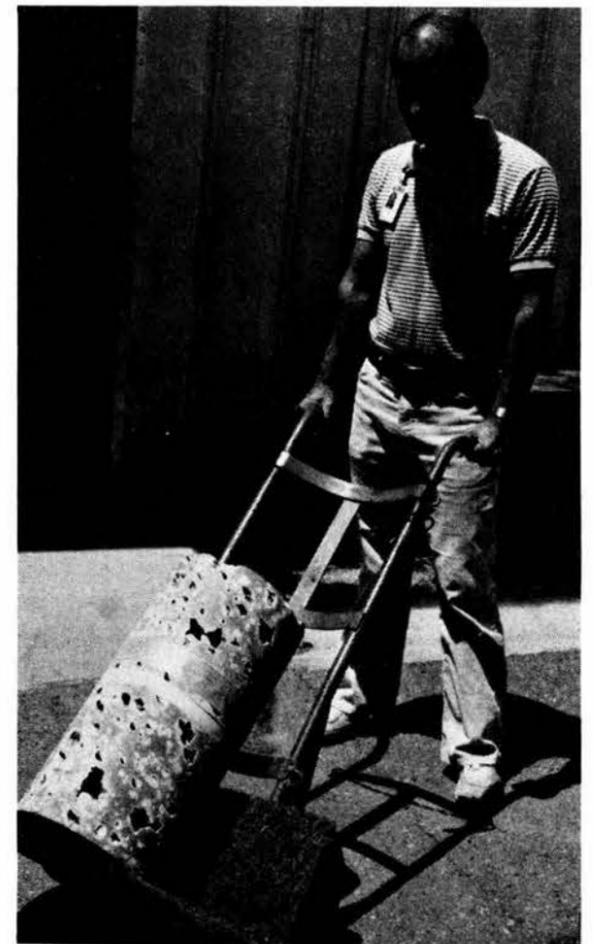
Unfortunately, the conductive plastics made up until now are extremely difficult to form into a specific shape because they cannot be dissolved or melted economically. Most tend to degrade very rapidly in air. These disadvantages make the currently available materials too expensive for most applications. So far, it is believed that only one such material is in commercial use, in a heart pacemaker.

But the new polymer John has made can be dissolved or melted and is fairly resis-

tant to attack by oxygen in the atmosphere. Its full name is poly(trimethylsilylacetylene) — PTMSA for short. "PTMSA itself can be made only about as conductive as the silicon used to manufacture chips for computers," says John, "but I've found that it can serve as a backbone or template for easy synthesis of other polymers that may be much more conductive."

John has studied the synthesis, characterization, and evaluation of novel, high-performance polymers since he came to Sandia in 1981. He began the current work by designing catalysts that cause the chemical trimethylsilylacetylene to link together in repeated units, a long-chain polymer: PTMSA. Experience has shown that, up to a point, the larger the size of a conductive polymer molecule, the better its electrical properties.

Although Russian and Japanese scien-



RON PRICE (1542) displays one of the large samples of tuff with holes (lithophysae) removed from the welded tuff formation at G-tunnel. Mechanical properties tests were performed in the Rock Mechanics laboratory to characterize the material for the NNWSI projects.

tists (working independently) have studied PTMSA, they have been able to produce it only as a mixture of relatively small molecules. John's catalysts are able to give molecular weights to the PTMSA that are ten to a hundred times greater than previously possible.

So What's a King to Do?



There was a king of Spain once, Philip III, who is said to have died of a fever he contracted from sitting too long near a hot brazier, helplessly overheating himself because the functionary whose duty it was to move the brazier when summoned could not be found.

(Barbara Tuchman, *Esquire*)

Supervisory Appointments

MARGARET CARROLL to supervisor of Plant Engineering Scheduling and Control Division 3661, effective Nov. 30.

Since joining the Labs in July 1978, Margaret has been a safety engineer in Safety Engineering Division 3442.

Margaret received a BS in safety engineering from Delgado College (New Orleans), a BA in social sciences from Louisiana State University, and an MS in public administration from UNM. She is a member of the American Society of Safety Engineers, the Society of Fire Protection Engineers, the American Industrial Hygiene Association, and the NM Women in Science and Engineering. She enjoys petrology, anthropology, cross-country skiing, and bicycling.

Margaret's husband, Bill, is the safety manager at UNM. They live in NE Albuquerque.

* * *

PAUL KONNICK to supervisor of Project Design Definition Division II 7652, effective Nov. 16.

Joining Sandia in 1961, Paul worked for the next five years as a design draftsman. He transferred to the interconnections group, working with high voltage connectors and cables, then moved into an applied physics organization. Paul completed a five-year MLS trainee program as a systems analyst with a computer group. Since last January, he has been with W76/MK4 Division 5154.

Paul received an associate degree in drafting and design technology from Penn State, his TIE certificate from Sandia in information systems, a BS in math from the U of A, and his MS in EECS from UNM. He is a member of the Electronic Connector Study Group. He enjoys camping, fishing, and golf. Paul and his wife Marilyn have five children, with two at home. They live in the NE heights.

* * *

ED THUMAN to supervisor of Systems Analysis and Automation Division 7622, effective Nov. 16.

Since joining the Labs as a staff member in 1957, Ed has worked with computing organizations. His assignments have included automation of personnel systems and case accounting systems; analyses of systems for personnel, property, and financial organizations; and the formulation of data base management and technology. For the past four years he has been with Product Data Systems Development Department 7620, working on design definition and computer-aided design development.

Ed received his BA in finance from the University of Minnesota. He enjoys hunting, fishing, and golf, and has been a member of the NM Mounted Patrol for 20 years. Ed and his wife Elizabeth have two daughters. They live in NE Albuquerque.

* * *

THERESA LOVATO to supervisor of Micrographics and Reprographics Division 7632, effective Nov. 16.

Terri joined the Labs in 1977 as a



MARGARET CARROLL (3661), PAUL KONNICK (7652), seated; ED THUMAN (7622), and TERRI LOVATO (7632), seated.



MIKE QUINLAN (3633-2) and JOHN CERUTTI (3611)

security inspector. She later worked in the micrographics and reprographics organizations and, in 1982, was promoted to supervisor of Micrographics Section 7632-1.

Terri received a BS in criminology from the U of A, and has taken photography courses at UNM. She is a member of the National Organization of Micrographics. She enjoys almost any sport involving physical activity. Terri's husband, Joseph, works at KAFB. They have a three-year-old daughter, and live in the south valley.

* * *

MICHAEL QUINLAN to supervisor of Construction Inspection Section 3633-2, effective Nov. 16.

Since joining the Labs in March 1981, Mike has worked with the mechanical design group in Buildings and Facilities Design Division 3643.

He received an associate degree in mechanical design from Southeast Community College (Neb.). He's a member of the American Society of Heating, Refrigeration, and Air Conditioning. Mike teaches an evening course at T-VI in solar energy and home heating theory. He's an avid golfer and also enjoys skiing and camping. Mike, his wife Gail, and their two children live in the SE heights.

* * *

JOHN CERUTTI, JR., to supervisor of Plant Utility Systems Division 3611, effective Nov. 30.

John has been an engineer with Buildings and Facilities Design Division 3632 since coming to the Labs in March 1976. Before joining Sandia, he was a plant engineer with Western Electric in Andover, Mass.

John received an associate degree in electrical engineering technology from Wentworth Institute of Technology (Mass.) and a BS in EE from Northeastern University (Mass.). His primary interest off the job is coaching Little League baseball and basketball. He and his wife Ruth have four children. They live in the NE heights.

Disciplines Define Dinosaur Demise



"The number of explanations for the extinction of the dinosaurs is getting out of hand, and not surprisingly perhaps, there is often a close tie between the ideas suggested and the discipline of the scientist making the suggestion. Thus, astronomers and geophysicists go for asteroids or comets; atmospheric scientists go for acid rain; ophthalmologists for cataract blindness; botanists for alkaloid poisoning; and dieticians for a reduction in fiber and natural oils leading to rampant dinosaurian constipation."

Natural History June 84

UT-Texas: MCC, 32 Chairs, and Resulting Phenomena

Back in the 19th century, the Texas state legislature gave millions of acres "that weren't worth much" to the fledgling University of Texas. This land was in West Texas where oil was discovered in the 1920s and ... well, you all know the rest.

Professor Ben Streetman, head of the Microelectronics Research Center at the University of Texas, visited Sandia recently to tell us, in part, what all that black gold has led to.

For one thing, oil income has been going into a permanent fund that now totals something like \$2.2 billion, which is shared with "our friends," as Streetman put it, at Texas A&M. The income itself cannot be spent, but the interest can and UT-Austin has been using it for a dramatic building program.

With all this as background, Streetman talked about Microelectronics and Computer Company's (MCC) choosing Austin as the site for its major new research venture. This, along with the university's announcement of 32 \$1 million endowed chairs in engineering and science, has created "a climate of opportunity and challenge for the university and the city."

Streetman explained how the endowed chairs came about: "This fellow came to us with \$8 million and told us he wanted to have some impact on the university but wished to remain anonymous — not have a chair named after him. He'd give us the \$8 million on the condition that somebody else give an equal amount. Well, we had no

trouble raising the money from various other sources and soon had \$16 million. And, since the university has a policy of providing matching funds, we had \$32 million with which we endowed the 32 chairs — 16 in engineering and 16 in the natural sciences. Our anonymous donor certainly had the impact he wanted."

The developments at Texas provide a model for cooperation between private industry and universities to deal with the "current crisis" (and we use the term deliberately) in electrical engineering. In the 1970s, there was a decline in the number of graduate and post-graduate students. The slack was somewhat taken up by foreign students, but the nation still had a shortage of PhDs to train the next generation of PhDs. Concomitantly, the increase in the productivity of U.S. industry was less than that of other industrialized countries, especially Japan.

Another important aspect of UT's program, according to Streetman, is to encourage talented students to go on for their PhDs instead of taking their MSs and "being hired by Sandia." At present, UT has 2000 undergraduate and 350 graduate students in the EE and computer science department. The university's last graduating class included 250 BSs, 60 MSs, and 15 PhDs — numbers that need to be increased. To this end, UT is setting aside doctoral fellowships totaling \$750,000, mainly for U.S. citizens, and starting a

strong recruiting program for National Merit Scholars.

"The teaching program is emerging, and research is starting up," says Streetman. "We're now in the process of filling these positions. A number of people hired by MCC hold concurrent teaching positions at the university, but we're also looking for top people to fill the endowed chairs."

Streetman added that the University of Texas already has about 700 total endowments, mostly in the humanities. Among his remarks about the strong humanities program, he mentioned that the library has a Gutenberg bible: "But it's a lot of trouble — you have to keep it in a specially maintained environment and hire a guard to watch it." To which someone in the audience retorted — "Sounds just like an IC fabrication lab."

Sympathy

To Ann Riley (7262) on the recent death of her father-in-law in Chicago.

To Mary Campbell (3523) on the recent death of her mother in Albuquerque.

To Laura Latoma (6414) on the recent death of her mother-in-law.

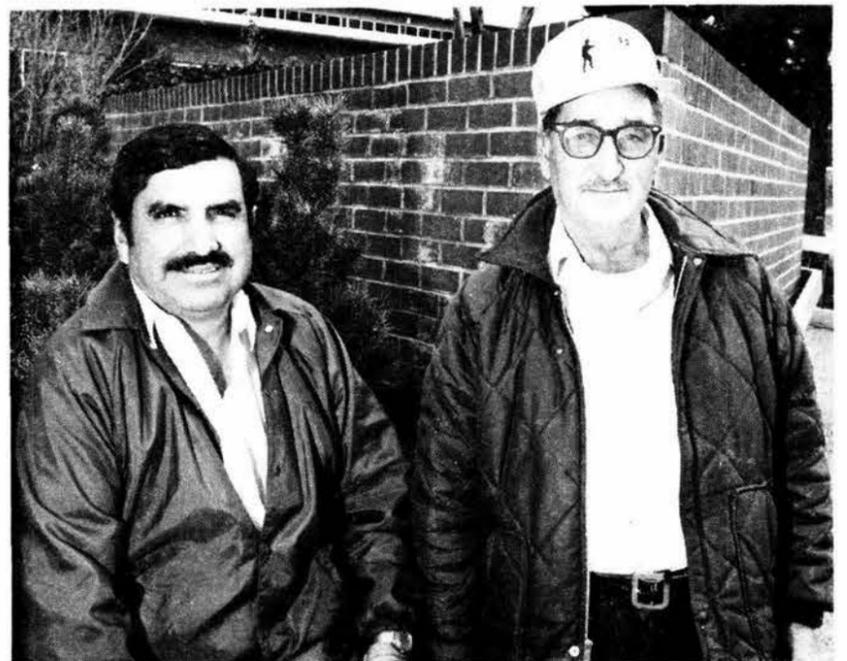
RETI R I N G



Herb Parsons (5110)



Bob Weaver (7472)



Joe Ochoa (3423), Julian Silva (3618)



John Dobias (2522), Charles Selby (5122), Roscoe Champion (6226)



Harvey Miller (7123), Fred Snyder (2634), Leon Moritz (5234)

Affirmative Action Policies Reaffirmed

EEO/AA

Once again I wish to reaffirm both my personal and Sandia National Laboratories' commitment to the principles of Equal Employment Opportunity and Affirmative Action. In Fiscal Year 1985, we will continue our policy of conducting all activities including recruiting, employment, compensation, benefits and services, training, advancement, promotion, transfer, and termination without regard to race, color, religion, national origin or sex, and in accordance with the laws and regulations concerning age, physical or mental handicap and disabled or Vietnam Era veterans. We will also ensure that employment, employee selection, and promotion decisions are in accordance with the principles of equal opportunity by imposing only valid requirements. Not only will we comply with the letter of the laws and regulations of federal and state governments but we will practice the true spirit of equal employment opportunity as a matter of Laboratories' policy.

The program of affirmative action to which we have pledged our support has produced positive results. We can be especially proud of the greater numbers of women and minorities on roll, of our handicapped program and of our positive image in the community. We must continue to concentrate our efforts in the coming year on the advancement and promotion of women and minorities into higher job classifications, and into supervision and management.

I expect all employees to foster a work environment that is free from discrimination and is supportive of female, minority, and handicapped employees and in which the full potential of all employees can be realized. Supervisors are expected to be familiar with the Affirmative Action Plan, to discuss its contents with their employees and to take an active and positive role in fulfilling our equal employment opportunity commitment. The ultimate objective toward which we continue to strive is optimum use of our human resources.

I will look to the Vice Presidents to take the lead in implementing Sandia's Affirmative Action Plan. J. R. Garcia, Director of Personnel, and staff will continue to monitor all equal employment opportunity activities and report to me on the effectiveness of our Affirmative Action Plan, including recommendations for necessary action to ensure attainment of our objectives.



George
Dacey,
Sandia
President

Sexual Harassment

It is against the policy of Sandia for any employee to harass another employee by making unwelcome sexual advances or requests for sexual favors, or engaging in other verbal or physical conduct of a sexual nature or displaying any pictures or objects of a sexual nature. Any such conduct which creates an intimidating, hostile or offensive working environment is absolutely prohibited.

No supervisor (or other employee responsible for work assignment) shall threaten or insinuate that an employee's submission to or rejection of sexual advances or requests for sexual favors will either enhance or adversely affect any terms or conditions of employment or career development.

Any employee who has a complaint of sexual harassment should report such conduct to immediate supervision or management or seek the assistance of any of the staff of the EEO/AA Division 3511 or the Personnel Division II, 8026 staff. An investigation of all complaints will be undertaken immediately. When an investigation confirms a complaint about an employee or agent, that person will be subject to appropriate sanctions ranging from a warning up to and including termination. Supervisors who fail to promptly take appropriate action regarding instances of sexual harassment coming to their attention will be subject to the same sanctions.

Given the nature of this type of discrimination, Sandia recognizes that false accusations can have serious effects on innocent employees. We trust that all employees will continue to act responsibly to establish a pleasant working environment free from all discrimination.

Handicapped/Veterans

Sandia National Laboratories reaffirms its policy of equal employment opportunity for all its employees and applicants through its commitment to full compliance with the Rehabilitation Act of 1973, as amended, and the revised Vietnam Era Veteran's Readjustment Assistance Act of 1974. We will foster a general understanding of and sensitivity to the problems of the handicapped and veterans to assure that as openings become available for which they are qualified, we may be better prepared to provide meaningful employment and advancement opportunities.

The Acts cover individuals with physical or mental impairments which could affect their ability to secure, retain, or advance in employment, whether or not they have previously been identified as handicapped. The Readjustment Assistance Act assures the Vietnam Era veterans that employers will offer them employment opportunities with the likelihood for advancement.

Therefore, employees and applicants who believe themselves covered by the regulations and who wish to receive consideration under our affirmative action program are invited, at their own discretion, to identify themselves as handicapped or a covered veteran through their supervisors, Personnel Representatives, or the Equal Employment Opportunity and Affirmative Action Staff. The information submitted will be considered confidential and will be used only as required to meet the provisions of the Acts. Refusal to provide the information will not subject any employee or applicant to adverse treatment. Employees and applicants are also protected from coercion, intimidation, interference or discrimination for filing a complaint or assisting in an investigation under the Act.

To assure the success of our policy and our continued compliance with applicable laws and regulations, supervisors are reminded that it is the responsibility of each of us to provide equal employment opportunities for the qualified mentally or physically handicapped individual, disabled, special disabled veteran, and Vietnam Era veteran. Overall administration and monitoring of the program has been delegated to J. R. Garcia, Director of Personnel, and his staff.



A handwritten signature in cursive script, appearing to read 'G. Dacey'.



KEYNOTE SPEAKER for the recent workshop on Tungsten for VLSI Applications, Arjun Saxena of AMI, is flanked by workshop co-chairman Bob Blewer (2147), left, and Bob Gregory, director of Microelectronics 2100. Workshop attracted 115 scientists and engineers from US and foreign countries to the Technology Transfer Center.

At TTC

Tungsten Workshop Attracts International Audience

A workshop on Tungsten for VLSI [Very Large Scale Integrated circuits] Applications, held last month in the Technology Transfer Center, attracted participants from almost every private and government laboratory working with refractory metals for integrated circuits. More than 50 companies were represented by 115 engineers and scientists from the US and seven foreign countries.

Tungsten is seen as one of the leading candidates to meet more stringent requirements for conductive interconnects, as microcircuit dimensions shrink to the submicron range. (One micron-wide conductors are already so small that a hundred, placed side-by-side, would equal the diameter of only one human hair.) Sandia, a leader in exploring this developing technology, organized the workshop to determine the extent of interest in this area. It also served as an information exchange among workers becoming active in the field.

Workshop attendance was greater than expected with major representation from Stanford University, Bell Labs, IBM, Hewlett-Packard, Texas Instruments, Motorola, Phillips/Sigmetics, Mostek, GE, Harris, and Intel. Managers of the Thin Film Division and the Advanced Technology Division at the Yorktown Heights Lab were among the eight IBM representatives.

Arjun Saxena of Gould AMI Semiconductors, the conference keynote speaker, emphasized the prospects of tungsten in meeting several requirements for future generations of microcircuits. Werner Metz of NCR discussed the favorable performance and reliability data for CMOS circuits in which LPCVD (Low-Pressure Chemical Vapor Deposition) selectively deposited tungsten was used as a polysilicon shunt and contact barrier. Also, Jim Rowland of Hewlett-Packard described the NMOS III technology with two levels of tungsten metallization used for the chip set, which is the heart of the HP 9000 computer series.

Sandia reported successful deposition of

tungsten in a selective manner to thicknesses three times greater than have yet been achieved by other laboratories. In addition, Sandia researchers reported on the utilization of LPCVD tungsten to achieve reduced contact resistance in both VLSI circuits and RTG (radioisotope thermoelectric generator) applications.

Videotapes of the following presentations are available from Bob Blewer (2147) who served as workshop co-chairman with Vic Wells (also 2147): keynote speech by Arjun Saxena (AMI), "VLSI Multi-level Metallizations: The Role of Tungsten;" "Selective CVD of Tungsten for MOS VLSI Applications" by Stanford professor Krishna Saraswat; "Thick Selective LPCVD Tungsten; Techniques and Characteristics," by Bob Blewer, Vic Wells (Sandia), and Maren Tracy (KMI); and the final panel discussion, "The Future of Refractory Metals in VLSI Applications." The workshop proceedings will be published in February.

The participants voted unanimously to hold the workshop again next year with Sandia sponsorship.



**Don't forget
the most
important
gift of all!**

✓ Donate Blood

Bloodmobile is at Sandia every Tuesday from 8 to 3. Call 4-7433 for the location, or call 843-6227 to schedule an appointment.

United Blood Services

Q. Why cannot something be done for people who carpool but work on opposite sides of the Labs? Why can't we get a badge for carpoolers (like the Second Shift people do) to make it obvious that the person parking is a carpooler? We are doing our share to conserve energy by carpooling, but because we work on opposite sides of the Labs we are not entitled to park in the two-or-more-people parking spaces.

A. An identifying sticker or decal for carpoolers has been proposed a couple of times before. Following is our response to an earlier proposal made in October 1979. We believe this response is still appropriate so we repeat it here:

"A system such as you suggest is similar to the previously attempted and discarded system of issuing a specifically reserved parking place for each car pool. Such a system places a heavy administrative burden on the Security Organization with no assurances that a valid car pool today is still valid next week or next month. Abuses of the reserved parking place method were abundant, and there is no apparent reason to believe a sticker system would be more successful.

"It is important to remember that the purpose of car pooling is to conserve energy and not merely to obtain a preferred parking location.

"We believe the present system (two people in the car when parked in the car pool slot), even with the limitations you pointed out, is a satisfactory one given factors such as parking facility use, employee convenience, rule enforcement, and company administrative burden."

C.L. Brumfield - 3400

Q. Are there any plans to restock the supply of chairs in Sandia's new conference rooms?

Several chairs are missing from some of these new facilities (old grey swivel chairs sometimes appear as replacements).

Perhaps it would be worthwhile to mark the chairs in some obvious way with the room number to which they belong.

When one schedules a meeting in a room that should accommodate 10 people and finds only 8 chairs, it is frustrating.

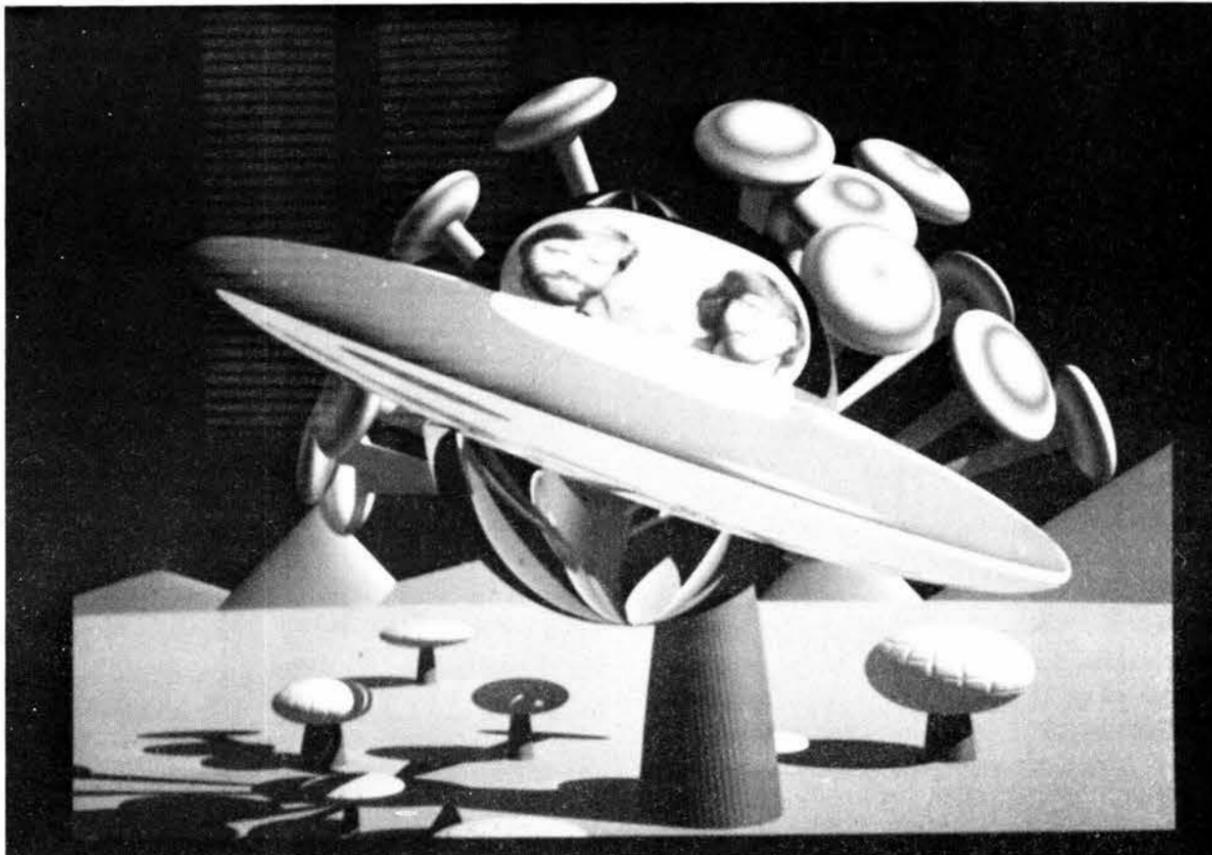
A. Each new conference room is equipped with an adequate number of upholstered chairs; some also contain a few stackable chairs to accommodate overflow. Unfortunately, employees occasionally decide that the easy way to get a new chair is to take one from the conference room. In your case, it appears that the person who took the new chair brought an old grey one as a replacement; or, it may be that someone had a meeting with more people than chairs and brought the old grey one rather than use one of the stackable chairs. It is not possible for the Furniture Section to keep up with chairs in conference rooms. I suggest that you report any chair problems to the person who schedules the conference room and ask for a replacement.

R.W. Hunnicutt - 3600

Q. Several months ago, Gate 8 to Tech Area I was "temporarily" closed. When can those of us who work in Bldg. 880 and points east expect Gate 8 to be permanently reopened?

A. We are sorry for the inconvenience the closure of this gate caused. We ask your continued understanding. The Security Organization continues to receive new assignments (such as required patrols for new buildings) that are mandated by DOE regulations. We have not received additional personnel to perform these tasks. Thus, we are faced with one alternative — stop doing some low priority (not required by DOE regulation) functions. Gate 8 is primarily a "convenience" gate, located only a few hundred feet east of Gate 7. Because of this, we give it relatively low priority and will reopen it only when we can clearly show that the manpower required is not more greatly needed elsewhere. We are exploring the possibility of installing another Mardix booth somewhere in the vicinity of Gate 8 that would accommodate employee traffic.

C.L. Brumfield - 3400



A FRAME from a computer-created animated video feature, "A Day in the Life of a Martian Magnolia," shows a silver spaceship piloted by its creators, Pete Watterberg and John Mareda (both 2644), in the foreground and a Martian landscape and a flower-like structure in the background. Created totally by a computer, the animated feature includes brilliant color, realistic shadows, reflections, and perspective plus rapid action.

Computer Graphics Output Now Available on Video Cassettes

George Lucas, move over.

John Mareda and Pete Watterberg of Distributed Processing Systems Division 2644 have created a 90-second animated video feature that was shown at the recent Siggraph '84 conference, the annual gathering of computer graphics specialists.

The feature is called "A Day in the Life of a Martian Magnolia," and it was created totally by a computer program (well, Pete recorded the background music on his guitar and sang the lyrics to "If I Only Had a Brain" from *The Wizard of Oz*, which was dubbed in after the visuals.) Words can't carry the impact of the animation, but we'll try:

After the title and credits, the screen shows a flat sand-colored landscape with mountains in the background. In the center of the screen is a strange organic structure with a main trunk and spike-like branches ending in multicolored half-spheres. It rotates slowly as the sun comes up, brightness increases, and shadows grow. The half-spheres, which could be called flowers, rotate independently.

Enter a spacecraft, saucer shaped with a dome of a pilot's cockpit on top. The spacecraft with its silver mirror-like reflecting surface zooms around the "Martian magnolia" joining in the merry-go-round action. The brilliant colors and endlessly changing shapes are reflected on its surface. On the ground, the shadows echo the action.

The spacecraft zooms in-and-out, off the screen and back, then enters the magnolia pattern again. Zap! A branch of the magnolia knocks the craft out of the air. It impacts into the surface and is about half-buried. In the background, Pete's voice laments, "If I Only Had a Brain."

Finis.

Star Wars it's not — the plot isn't much but the special effects are great — spec-

tacular action, realistic shading and shadows, brilliant color, and believable perspective.

"We created the video for two reasons," John Mareda says. "First, we wanted to demonstrate Pete's research in Surrealistic Scene Synthesis Software and its ability to create reflections, refractions, shading, and shadows. Secondly, and this has more immediate company-wide applications, we wanted to demonstrate Sandia's new computer graphics equipment, now available, to produce animated video recordings under program control."

The equipment, called VAS IV, is now available on the 2644 Development VAX. It is possible to have graphic output from scientific programs recorded directly onto video cassettes. These programs can be run on any of the scientific main frame computers using existing graphics software. That output data can be transferred to the Development VAX for recording.

"Several Sandians have done this," John says, "using current on-line computer graphics programs. The results are impressive. The quality is first rate. The final product is a video cassette that fits into any standard 3/4-inch video playback set. It's very handy for conferences, for meetings, for show-and-tell situations. As a matter of fact, the presentations on video are very slick and professional — our equipment can record narration or sound effects — even music."

Pete is continuing his SSSS research. He and John have spent many months of their own time perfecting and using it, but it needs to be made "user friendly" before it can become generally available to the computing community.

However, output of all standard computer graphics packages is now available on video cassettes. Call John on 4-6672.



Here are some current volunteer opportunities for employees, retirees, and family members. If you would like more information, call Karen Shane (4-3268).

ALBUQUERQUE LITTLE THEATER needs a position indicator for its rotating stage so the behind-the-scenes operator can tell where the stage is.

CATHOLIC SOCIAL SERVICES OF ALBUQUERQUE, a United Way agency, is seeking case workers to respond to needs of the elderly.

SALVATION ARMY needs help during the holidays at its food and gift distribution center at the Civic Auditorium.

Death

William Vigil of Sensor Applications Division I 323 died Nov. 22 after an illness. He was 50.

He had worked at the Labs since July 1968.

Survivors include his wife, three daughters, and a son.





AREA IV PEOPLE are safer now than they once were. That's because these residents recently received their certification as CPR (cardiopulmonary resuscitation) instructors; they will now teach the people they work with to give CPR and will conduct an annual recertification for each one. Dr. Judy Ewing (3330) and Steve Goldstein (1254) agreed that Area IV was in need of such training — it's populated by people who must work closely with very high voltages, and it's too far from Medical to get the instantaneous help needed in case of an accident. ("You have four to six minutes to restore blood to the brain," says

Judy. "After that, you will probably have irreversible brain damage.") Medical is eager to jolt groups in other remote areas into beginning a similar program. Standing: Chuck McClenahan (1232), Gwen Gorman (3332), Ed Ratliff (1221), Richard Cleary (Ktech), Steve, Dennis Nations (1254), Jay Penn (Ktech), and Bob Ross (Ktech). Kneeling: Tam Jacobs (1251) with Resusc Annie, Bob Johnston (1254), Jim Furaus (1201), and Charles Gonzales of Presbyterian Heart Institute; he and Gwen trained the new Area IV CPR instructors.

Ham Radio Operator

Sandian Takes World Championship

Bruce Draper (2149) and a friend from college teamed up recently to win the world championship in an amateur radio competition sponsored by the American Radio Relay League.

Bruce and Ray Sokola (Motorola, Schaumburg, Ill.) set up their equipment in a rented apartment near the beach on Grand Cayman Island in the British West Indies and, during a 48-hour period, made 8200 contacts in the multioperator/single transmitter class for a total score of more than 7.4 million points. Some 2900 ham radio operators throughout the world were competing in the ARRL International DX Contest.

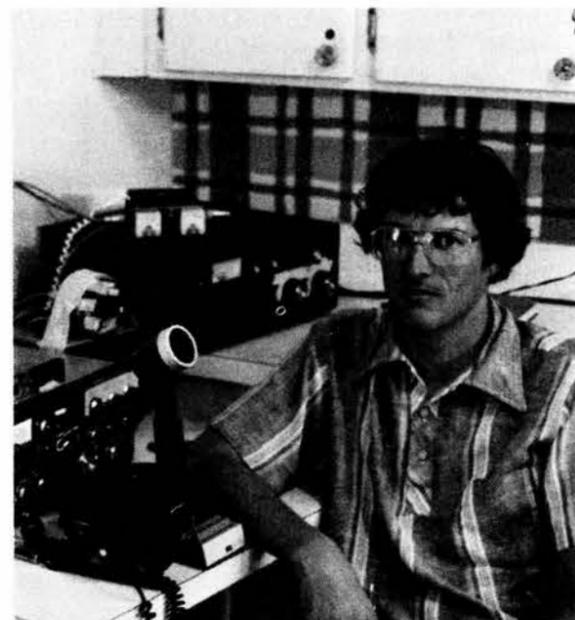
"The idea is to contact as many operators from as many different places as possible during the contest period," Bruce says. "Ray and I competed together in past years without coming close to the championship. This year we decided to mount a first class effort."

The team chose Grand Cayman Island as a base because of its "excellent radio propagation to the U.S. and Canada." Planning started six months before the event. First step was obtaining a radio license from the Grand Cayman government. Second step was reserving the apartment on the beach — through their ham radio activities they knew that the place included a very good antenna they could use.

"Then we had to plan which gear we would use — all conventional off-the-shelf items — and discuss the logistics," Bruce says. "We carried all the equipment as hand luggage on the airliners.

"We stayed 10 days at Grand Cayman. For eight of those days Ray and I and our wives were tourists — scuba diving, swimming on the beach, attending an Island fair, sampling exotic food, and all those good things. It was a great vacation.

"The contest itself became a matter of endurance. Ray and I got maybe six hours of sleep between us during those two days."



BRUCE DRAPER (2149), snapped in a room in an apartment on Grand Cayman Island, has just completed a 48-hour amateur radio contest in which he and Ray Sokola contacted more than 8200 other operators. Scoring 7.4 million points in the contest, they won the world championship.

The Solar System — How Came It to Be?

We've come a long way in two thousand years — or have we? This was the essence of a recent talk entitled "Theories of the Origin of the Solar System, 1596 to 1984," presented by Stephen Brush (Institute for Physical Science and Technology, University of Maryland.)

"But that's only 388 years," some mathematically inclined reader might protest. True, but theorizing about the solar system or the universe (essentially one and the same thing in those days) goes back at least to Ptolemy, the second-century Hellenistic astronomer in Alexandria, Egypt.

To Ptolemy goes the credit for the geocentric solar system, i.e., the idea that the sun and all the known planets (up to Saturn) revolved around the Earth. To Ptolemy and the other astronomers of his time, this idea was supported by observational evidence. During the Middle Ages, the Ptolemaic system fitted in quite comfortably with Christian theology.

The rest of the story is familiar — Copernicus proposed his revolutionary heliocentric theory (that the sun is at the center of the universe, i.e. solar system), and Galileo got in trouble for proving it was so.

This was one of Brush's points — that the "philosophical viewpoint" is as important a factor in scientific problem-solving as definition of the problem and how one goes about investigating it.

For instance Johannes Kepler (1571-1630) was working within the framework of the concept of the universe popular then when he calculated the elliptical orbit of Mars in 1596. This concept, based on the biblical account in Genesis, held that the cosmos had been created, essentially in its present form, about 6000 years earlier. Further, Kepler maintained that there could be only five planets — to represent the five regular solids of which the universe was

composed — (a popular belief in the 16th and 17th centuries).

Moving up to the philosophical viewpoints that underlie modern science, Brush observed that we tend to explain things in terms of slow, gradual evolution entailing matter and motion. Scientists have given up the idea that the universe was created as we see it now. Descartes expressed this idea of "particles moving about hitting each other" in the early 17th century. But it was not until the mid-19th century that a time frame of millions of years was generally accepted.

Even today, Newtonian mechanics is the basis for many theories of planetary formation. To this tool were added thermodynamics in the mid-19th century and nuclear physics in the 20th (to establish time scales through radiometric dating). Other tools, of course, are telescopes, for determining planetary rotation and observing satellites, and spectroscopes, for detecting chemical composition.

But, historically, scientists were not very motivated to theorize about the origins of the solar system. Marquis Pierre Simon LaPlace (1749-1827) stated his hypothesis of nebular formation in a footnote to a popular astronomy book he wrote. The topic did not seem to attract many of the best minds. One problem was how to test the theories: we can't see any other planetary systems, so it's difficult to develop hard scientific theories about events that took place in the distant past.

Recently, however, the discovery of the microwave background radiation — a vestige of the "Big Bang" — by Bell Labs scientists Arno Penzias and Robert Wilson in 1964 started to change all that. Also the space program is making it possible to make close-up studies of the solar system — from moon rocks to Saturn's satellite, Titan. The Infrared Satellite recently established the existence of protosatellites

around a number of nearby stars.

Brush explained that there are basically two types of theories on the origins of the solar system: (1) monistic or single process — e.g., a gas cloud condensing into the sun and planets; and (2) dualistic — the sun existed without the planets and another object (a star) brushing past the sun drew material out that cooled and condensed into the planets. The latter theory's implication is that since such an event would be very rare, the existence of other planetary systems (and life) would be unlikely. The monistic theory holds open the possibility of many planetary systems (and life) in the universe since planetary formation would be a natural process in the evolution of single stars.

The dualistic theory was generally rejected in the 1930s, but a number of monistic theories have been proposed and an equal number have fallen from favor. A recent example of the latter is the "supernova trigger theory" (a variation that has some elements of the dualistic theory). Aluminum²⁶ decays into magnesium²⁶ and the widespread presence of the latter indicated to some scientists that Al²⁶ had been formed in a supernova explosion before the formation of the sun. This led in turn to the theory that shock waves from this supernova explosion condensed the gas cloud that was to become our solar system. But further research into the formation of Al²⁶ indicated that it can occur at lower energies — in novae or in the atmospheres of red giants. Thus the supernova trigger theory is now out of fashion.

On one fact the scientific community is generally in agreement, according to Brush: the age of the Earth and the solar system is 4.5 billion years. But the origin of the solar system remains the oldest unanswered question in modern science.

St. John's Grad Institute Offers Albuquerque Programs

The Graduate Institute of St. John's College in Santa Fe is again offering its unique classes in Albuquerque this academic year. Sandians seeking challenges beyond those of traditional learning are encouraged to inquire about the program.

The Graduate Institute curriculum consists of about 70 classic works, from Homer and the Bible; through the Greek, Roman, Medieval, and Renaissance periods; and into the 20th century. The program is divided into four segments: mathematics and natural science, politics and society, philosophy and theology, and literature.

"A special concern of the St. John's program is to bring science and mathematics into the liberal arts tradition," notes Tom Simpson, one of the local tutors (instructors).

Classes take the form of conversations led by the tutors and are based on the works prescribed. Classes are held at the Albuquerque Academy from 6 to 10 each Monday and Thursday evening during the school year. From Jan. 14 to May 16, the

segment on philosophy and theology is offered.

Although financial aid from Sandia for St. John's courses is not available, course completions (nine hours of credit per segment) will be certified on transcripts for inclusion on personnel records. Financial aid and installment payment plans are available through the College; tuition is \$1260 per semester.

Two Sandians and one DOEan have participated in St. John's courses: John Cantwell (3520), Bonnie Conley (300), and Bill McMullen (DOE).

Bonnie finished her master's in liberal education last spring. "I can't praise the St. John's program highly enough," she reports. "The intellectual stimulation of reading the great books of the western world is most fulfilling: the experience provides an insight into why ideas evolved the way they did through the centuries. The program was a challenge — a most worthwhile challenge — that has enriched my life."

"What intrigues me most is the chance to read the classics, then discuss them with others, both tutors and students, in a

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Take Note

Members of the Albuquerque Youth Symphony and the AYS Parents' Association are selling luminarias to raise funds for the orchestra's annual tour in February. Luminarias are \$4 per dozen and are available from any AYS member or by calling 296-3196 or 296-2533. Orders of three dozen or more will be delivered on Saturday, Dec. 15. Deadline for ordering is tomorrow, Dec. 8.

* * *

The Maxwell Museum of Anthropology at UNM is offering the following public programs:

Dec. 9, Soundscapes of New Mexico presents the traditional forms of Northern New Mexican music in live performance. Accompanied by two folk violinists, Peter White will speak on the music and its historical development. 1-4 p.m., admission \$2.50.

Dec. 13, Hopi Tales is an evening with Terrance Talaswaima, master story teller of Hopi and Curator at the Hopi Cultural Center Museum, Second Mesa. 7:30 p.m., admission \$1.50.

Dec. 15, Los Pastores is a traditional New Mexican Nativity play performed by Los Pastores de Belen from Our Lady of Belen Church. The performance will be in Spanish with English scripts available to the audience. 1-4 p.m.; seating is limited; admission free.

The museum is located on University Blvd. one block north of Grand. Free parking adjacent to the museum is available. For more information, call 277-4404.

* * *

Inventions by Leonardo Da Vinci are on display at the Main Albuquerque Public Library through Dec. 31. The IBM Corporation took da Vinci's notes and made working models of his ideas, including a military tank, an automatic printing press, a flying machine, and a spring-driven automobile. The exhibit is on the Main Floor of the Library, 5th & Copper.

* * *

Larry Lopez (3151), chairman of the Edelweiss am Rio Grande German American Club's annual Fasching parade and beer and wurst fest for the past three years, has been named the official representative of the City of Albuquerque to the Grand Senate of Karneval of Cologne, West Germany.

Larry hopes to make the Albuquerque Fasching festival a regional event. Some 10 thousand participated last year, including the German ambassador to the U.S. Next year, the parade and festival will be held on Feb. 17.

* * *

The December meeting of the NM Section of ASME will be held at 7 p.m., Dec. 11, at Reddy's Rendezvous Room, Public Service Company, 414 Silver SW. Chuck Abadie, with Peat, Marwick, and Mitchell, will talk about "Tax Laws and Personal Investing."

* * *

Maj. Gen. George Withers, USA, is the new director of the Office of Military Applications. He replaces Maj. Gen. William Hoover, who is now the DOE's Assistant Secretary for Defense Programs.

* * *



POETIC JUSTICE? This owner of a front-wheel-drive car learned the hard way not to break the Eighth Commandment of Parking at Sandia (see LAB NEWS, June 11, 1982): "Thou shalt not park outside established parking bumpers or earthen mounds that shew parking spaces in lots whereof asphalt lies not upon the earth." With parking slots increasingly scarce, the temptation to park anywhere your vehicle will fit is great. But be of stout heart, resist the temptation, and seek a slot in distant unfilled lots.



AMPLIFIER AND HEADSET connected to the instructor's microphone enable Judy Tripp (7522) to hear everything that goes on in Donna Rix's (3151) Technical Writing class, part of the INTEC education program. The equipment, which is connected with the video system as the course is being recorded on videotape, was put together by Don Morrow (3522). Judy, who usually reads lips very well, was having difficulty in the class. Don provided the gear as "a little extra service from Education and Training Division II."

Steve Barnard (7474) and Jerry Brock (7481) instruct a weekly 20-hour motorcycle safety course for the New Mexico Highway Department. Classes are held Monday through Thursday from 6 to 9 p.m. and from 8 to 5 on Saturdays. If the student is a beginner, a state motorcycle operator's license is awarded after successful completion of the course. Motorcycles and helmets are furnished. Cost is \$45. The class meets at the State Motor Vehicle building, 34401 I-25 Frontage Road. For additional information, call Steve at home, 831-4114.

* * *

If you'd like to help out the Easter Seal Society and gladden the heart of a tot at the same time, arrange for Santa, his elves, or his reindeer to give him/her a phone call. The calls will be made by Civitan Club members of Albuquerque posing as North Pole denizens to chat with the kids (two years and up) about their Christmas wishes. Each call costs \$2 for local kids, \$4 elsewhere in New Mexico. The money goes to Easter Seals and will be used to benefit senior citizens and people with disabling conditions. Calls will be made from 5:30 to 9:30 Dec. 17-21. Pick up registration forms at any United New Mexico Bank (another sponsor of the program), the Civitan gift

wrapping booths in Coronado or Winrock, the Society (4805 Menaul NE), or the LAB NEWS office. More info on 888-3811.

* * *

Tomorrow is the only day to buy tickets for Sun-Tran's annual luminaria tour on Christmas Eve; tickets (\$4.25 each) are on sale from 8 a.m. to 5 p.m. (or while tickets last) at the Sun-Tran office (601 Yale SE), and each buyer is limited to 10. Tours begin at the northwest corner of University and Stadium every 15 minutes from 6 through 8:30 p.m. (except for 7:15 and 7:30) on Dec. 24. Each bus tours the Country Club, Old Town, and Los Altos SW areas and takes less than two hours. More information from 766-7830. For information on tours and tickets for the handicapped, call the Sun-Van on 255-8735.

* * *

The Bldg. 802 Lobby Art Gallery is showing the work of two artists through December. Louise Laval (wife of Joe, 3163) has created costumed figures she calls icons — mystical spirit representations designed to evoke emotion. Sara McGee, a Corrales painter, is showing her monoprints (single run) that are inspired by New Mexico penitente or religious scenes.

Camp Counselor for Kids with Cancer

Rob (1524) and Pat Rechard were married last July in Salt Lake City, and then spent a week honeymooning in the Bahamas — a typical, romantic way to begin a marriage. However, the second week of their honeymoon was not so typical.

Three years ago, Rob joined a friend who lives in Laramie, Wyo., for a rock-climbing vacation. His friend, Tom Gentry, told Rob of his recent experience as a counselor at a summer camp in Colorado for children who had cancer. Tom was so enthusiastic and insistent about how much Rob would enjoy working with the group that Rob became a counselor last year. Rob then convinced Pat that she, too, would enjoy the experience; thus, the second week of their honeymoon was spent at the Sky High Hope Camp near Colorado Springs.

The camp, one of six in the U.S., was founded by Dr. Harry Wilson, oncology nurse Nancy King, teacher Shirley Bloom, and others from Denver Children's Hospital. It is funded in part by the American Cancer Society and by voluntary contributions, especially by some large corporate donations from the Denver area. Arrangements were made to lease a Girl Scout Camp for the last week of the summer season.

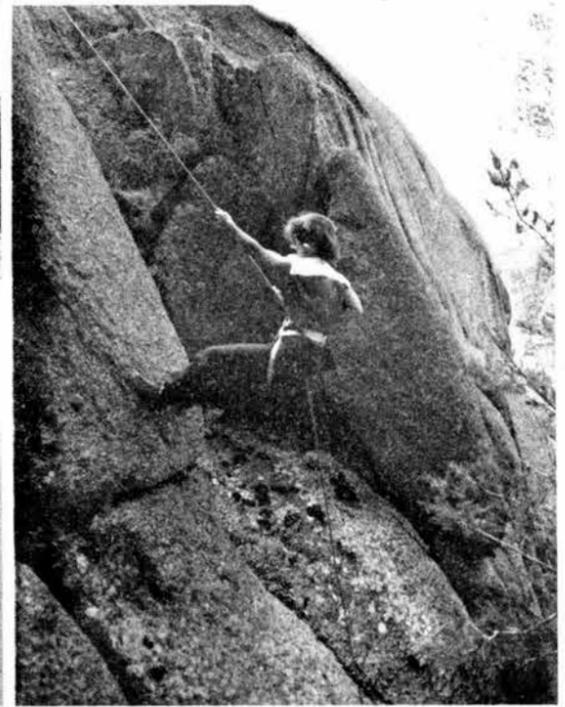
"It's a beautiful Colorado setting," Rob says, "with a modern lodge and all that's required for a summer camp. In fact, being a part of the program brought back all my own memories of good times at camp."

The counselors meet with the medical staff a day before the children arrive to discuss the type of cancer each child has and the medications each will receive. "I was scared that first year," Rob says. "The word 'cancer' evokes strong feelings, but when it's associated with children, it somehow seems worse."

The staff of 35 cares for 50 to 75 children, ages 7 to 18. The children attend the camp with the permission of their parents and their personal physicians. "Before the camp opens, Dr. Wilson talks to each of those physicians about the treatment for each child," Rob says. "Not all of the kids are hospital patients, but all have, or have had, active cancer and have been in and out of hospitals. The contrast between the hospital atmosphere and that of the camp just lights up those kids."

Rob was the camp canoe instructor — a skill he developed as a Boy Scout. Other activities included rock climbing, horseback riding, archery, map reading, bird watching, arts and crafts, and camping. "The kids participated in typical summer camp activities, and after a day or two I began to realize how normal the situation was. It began to seem to me that this was just a segment of their development," Rob says.

Rob described his group of youngsters, ages 13 to 16, as a challenge. "It was really fun being with those kids for a week. They are typical teenagers. Even with what they've been through, most of them have developed a positive outlook. That helped the counselors, because we try, in the limited time we have, to build self-confidence. With this group, peer pressure was important — 'If you can do it, I can do it.' I was surprised that two of the most popular activities were rock climbing and



ROB RECHARD (1524) gives a lesson in canoeing while his wife Pat practices rappelling.

S. Hwy. 14 Project Suggests Books for Gifts

The latest addition to the LAB NEWS selection of books is the long-awaited *New Mexico: A New Guide to the Colorful State* by a collection of authors (Chilton, Chilton, Arango, Dudley, Neary, & Stelzner) and published by UNM Press. Its predecessor was the 1940 WPA publication of the same name. This is not an updating but a completely new book in large format, with 416 pages and over 200 illustrations. For New Mexicans, actual and would be, the book can be enjoyed as a reference work or simply on its narrative merits. It includes

horseback riding. But it's a thrill to see a youngster who has lost a leg to bone cancer slip into the equipment, climb up a rock face, and then rappel to the bottom.

"We took the kids for an overnight camping trip. While I was setting up the camp, I was really touched to see two youngsters, both without hair, sitting together and comparing notes on their chemotherapy treatments. Comfortable with one another, they discussed their painful experiences.

"Activities were geared to the child. Some of the kids were weak, others were stronger. The thing I noticed, common to all of them, was that they were eager to get started on any activity and were really charged up. But after three to four hours, they became completely exhausted. In one respect, the counselors really had an easy time of it — these kids went to bed at night and *slept*. We all laughed about the shenanigans that go on at night at a regular summer camp — counselors always have to be on the alert."

Rob's friend Tom and his wife were also at the camp this summer. One of the counselors was from New York; she had seen a TV documentary and offered a week of her vacation as a volunteer.

"It is so rewarding," Rob says. "Both times I came home feeling great. I learned from those kids; the experience puts your own problems in a different perspective. I smile a lot now, especially when I receive a letter or a Christmas card from one of the kids. Pat enjoyed it too. We're going back next year."

18 tours within the state, 30 maps, a section on the state's special events, chapters on the land, people, history, literature, economy, food, art, and more. Open it at random and some interesting tidbit about a colorful character or an off-the-wall locale is offered. Books written by committee sometimes falter — this one doesn't. It's right for Christmas and runs \$17.50.

For years, Bob Casper, photographer and retired Sandian, has photographed luminarias. He has now published a booklet, *The Little Lights at Christmas*, that reproduces a selection of his best color photos and slides, along with a small amount of text describing this New Mexico tradition. It's available at the LAB NEWS office for \$3.50.

Still in stock at the LAB NEWS office are the following: *New Mexico Place Names* by Pearce, \$6.95; *Guide to New Mexico Mountains* by Ungnade, \$8.95; *Buckboard Days* by Poe, \$9.95; *Albuquerque, A Narrative History* by Simmons, \$17.50; *People of the Sun* by Simmons, \$14.95; *The Aficionado's Southwestern Cooking* by Johnson, \$5.95; *New Mexicans I Knew: Memoirs 1892-1969* by Keleher, \$9.95; *Wildflowers Along Forest and Mesa Trails* by Godfrey, \$9.95; *Enchanted Trails from New Mexico Magazine*, \$5.95; *The Cumbres & Toltec Scenic Railroad* by Wilson and Glover, \$10.95; and *The Southwest* by Lavender, \$12.95.

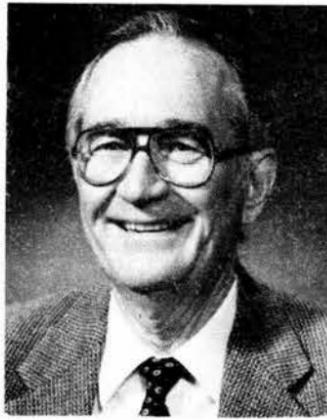
Other books for sale include *Rebels on the Rio Grande*, edited by former Sandian Don Alberts, \$9.95; *Project W-47* by retired Sandian Les Rowe, \$5.95; *More Time Than Money — A Travel Kit for Leisurely, Reasonable Travel Abroad* by former Sandian Cherry Burns, \$5; and *Ski Touring in Northern New Mexico* by Sam Beard (1633), \$4.95.

The Project also has a new supply of Sandia T-shirts (\$6), caps (\$6), and belt buckles (\$8), as well as 16" x 20" aerial color photographs of the Tech Area (\$20).

MILEPOSTS

LAB NEWS

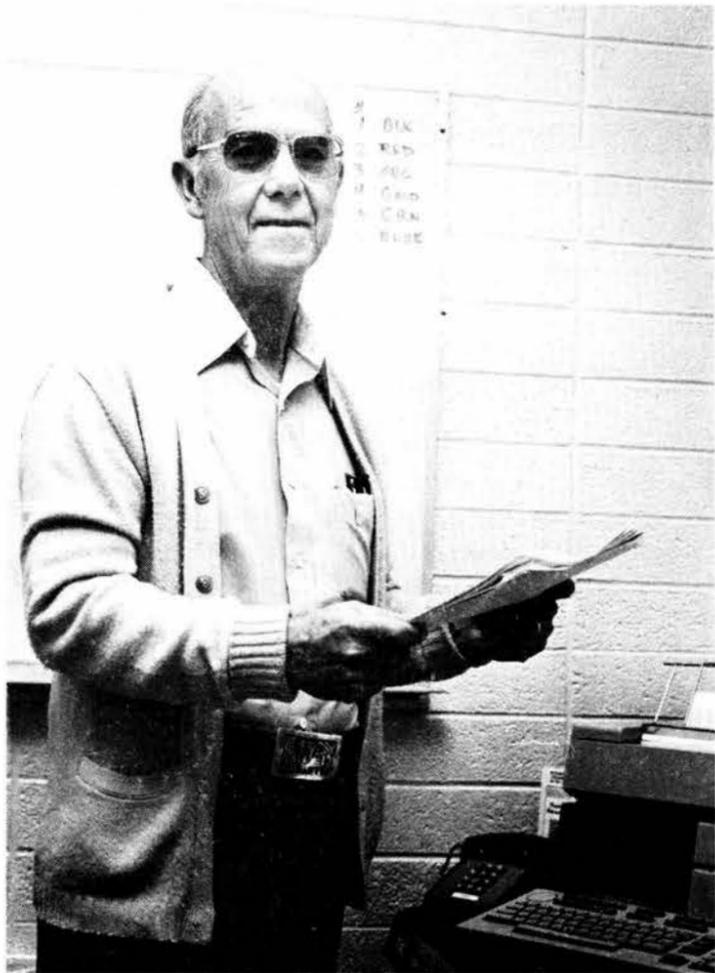
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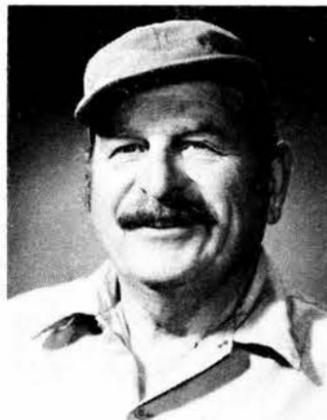
Bob Hawk (7633) 35



Mac Griffin (2530) 30



Jack Barnum (2321) 30



Stephen Zdunek (3618) 25



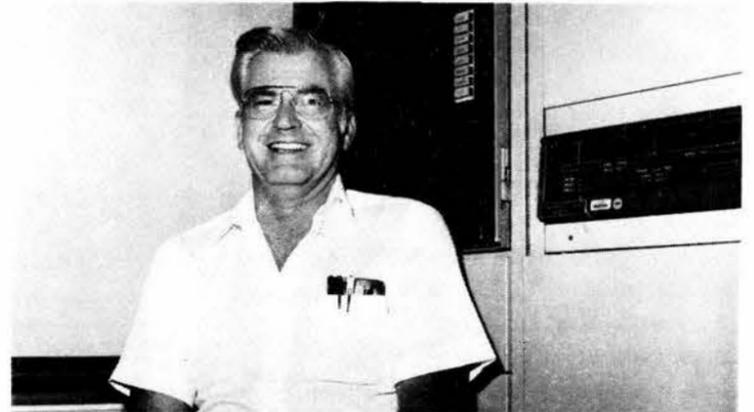
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Al Kaping (3733) 30



Wil Jorgenson (8444) 15



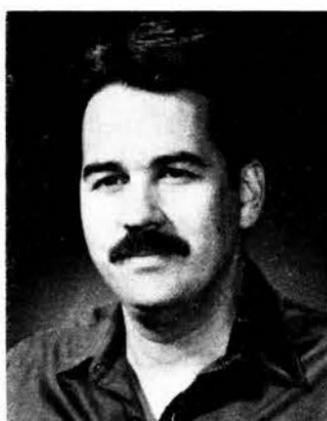
Richard Williams (7172) 15



Ken Tschritter (8182) 20



Juan Garcia (3154) 15



Michael Finley (2631) 15



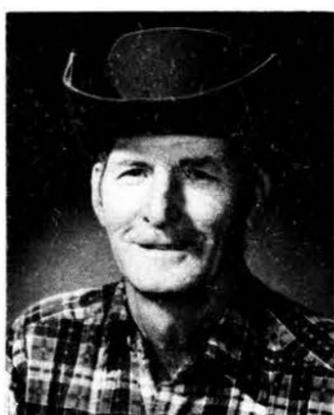
Robert Williams (6314) 10



John Walter (7480) 15



Howard Mauldin (2566) 35



Perry Randall (7472) 15



Charles Fleetwood (7651) 10



Cecil Page (5121) 35

Dec. 7-8 — Christmas Arts and Crafts Show, 10 a.m., Montgomery Plaza Mall, 243-4067.

Dec. 9 — Music at the Museum series; Bach Christmas program, 3 p.m., auditorium, Albuquerque Museum.

Dec. 12 — Pueblo celebrations: Gift Throwing, Isleta; Matachines, Jemez; Flag, Deer, and Buffalo dances, Tesuque; Comanche, Buffalo, and Bow & Arrow dances, Pojoaque. Contact pueblos for more information.

Dec. 14-15 — NM Symphony Orchestra con-

cert, with guests Nancy Allen harpist, and Jahja Ling, conductor. 8:15 p.m., Popejoy.

Dec. 15 — Las Posadas — folk play (The Inns) representing Mary and Joseph's

Events Calendar

search for shelter in Bethlehem; 6 p.m., Baralás Community Center, 766-7802.

Dec. 15-16 — "The Twelve Ways of Christmas," Albuquerque Opera and Alber-

que Children's Theatre, 1:30 and 3:30 matinees each day, KiMo.

Dec. 16 — Movietime at the KiMo, Movies by Great Directors: "Singin' In the Rain," Gene Kelly and Stanley Donan (1952), 7 p.m., KiMo.

Through Jan 12 — The Explorations of Earl H. Morris — A famous American archaeologist who worked in the Southwest during the first half of this century. Maxwell Museum of Anthropology, UNM, 277-4404.

UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS

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RULES

1. Limit 20 words.
2. One ad per issue per category.
3. Submit in writing. No phone-ins.
4. Use home telephone numbers.
5. For active and retired Sandians and DOE employees.
6. No commercial ads, please.
7. No more than two insertions of same ad.
8. Include name and organization.
9. Housing listed here for sale is available for occupancy without regard to race, creed, color, or national origin.

MISCELLANEOUS

WINDSHIELD for small motorcycle or moped, mounts to handlebars, \$15. Holmes, 292-0898.

WINDBERG print, "Harmony in the Highlands," signed, framed, 16" x 28", \$125. Harris, 299-4559.

19" COLOR TV, Zenith Chromacolor, \$100. Graham, 293-7302.

FOUR new Fenton Gyro slotted dish alum. mags, multi-fit, 5-bolt pattern, chrome stems, 14 x 7, \$50 ea. Coleman, 299-8321.

ROLL-A-WAY bed, 48", coil springs, foam mattress, \$30. Hodgden, 883-4752.

DRAPES, antique gold, for 7' wide window, floor length, lined, w/decorator rods; sheers w/rods, \$125. Maydew, 821-0102.

SWORD, old Oddfellows, no scabbard, \$20; 72 6" concrete blocks, 26 2" patio blocks, half price, you haul. Gregory, 268-2022.

STEEL Tonka toys, 1/10 scale; HO gauge train set, \$35. Hickman, 296-6989.

HOTPOINT washer, yellow, new motor & control switches 1 yr. ago, \$190. Romero, 821-7629.

FURNACE, forced air, natural gas, \$75. Lorenz, 281-9321.

PING PONG table, folding, w/caster, \$35; glass chimneys, 15 for \$20. Stromberg, 255-6131.

BOX springs, \$25; Hollywood frames, \$15, for single bed. Stephenson, 296-9330.

BLACK pumps, 1-1/2" heel, size 6-1/2, worn once, Thom McAn brand, paid \$30, sell for \$23. Armijo, 345-7385.

4' WEEPING FIG plant, \$20; Strolee car seat, \$10. Zutavern, 298-6523.

SLIDE projector, Argus 500 watt, \$35; slide cartridges for same, each holds 36 slides, \$1.25 ea. Bureta, 292-5421.

13" RIMS w/radial tires, fit '77-'79 Pinto & Mustang, \$10 ea. Dietzel, 294-4702.

ELECTRIC wheelchair, Everett & Jennings, never used, \$1500 firm. Bauer, 266-8480.

TI printer display calculator w/memory, TI-5130, \$40; Water Pik-steamer shower massage, \$25; MW elec. heater w/heat sensor, \$25. Hamblett, 298-6052.

DISHWASHER, \$200; jars, \$2/doz.; glass top kitchen set w/5 chairs, \$150; glass top coffee table, \$35; book case, \$35. O'Neil, 892-6754.

AM/SSB base station, Telstat SSB-140, 40 channel, tuner & 3B power mic., "Starduster" ant. w/cable, \$350 OBO. Whittet, 281-2216 after 5.

POLAROID 35mm processor, new, still in box, \$45. Passman, 821-4999.

CHINA cabinet, make offer. Eckley, 294-7650.

PIANO, upright Anderson, dark finish. Carson, 898-8847.

TIMEX-SINCLAIR computer, printer, 16K RAM, all in orig. boxes, extra software, manuals, \$50 complete. Crowther, 821-0172.

SOFA, contemporary, 7' long, \$100; sofa bed & marching arm chair, \$200; coffee table, Spanish (Sandoval), 4' hexagonal, \$50. Stevens, 299-6086.

IBM PC parts, single sided disc drive, Async. comm (serial) card, DOS1.10. Phipps, 299-8490.

Remington model 70 22-250 cal., bull barrel, Leopold 12X scope; 6' sliding glass door. Cumiford, 877-6498.

RING, .59 carat diamond solitaire graded AGS 0/0/3 (cut, color, clarity; o best; scale 0-10). Craft, 821-1369.

TIRE chains for '77 Rabbit, \$30, #1806 fits 6.00-12, 155-R12, 5.20-13, 145R-13, 155R-13, 155/80R-13, 6.15-13. Grace, 292-5368.

RCA 19" color TV, \$175. Eley, 296-3185.

AKC Cocker Spaniel puppies, born Oct. 17, five to choose from at \$150 ea., champion bloodlines, parents on premises. Gray, 897-0525.

BPI general accounting and ATI(BPI) training software packages, IBM compatible, \$300. Brewster, 898-0144.

MINK cape; Le Coultre solid gold watch, ladies. Collins, 292-0495.

CONCERTONE 7" reel-to-reel tape recorder, \$50; tape reels 1800', \$1.50 ea.; one alignment tape, \$3. Henry, 266-6467.

DISHES, service for 8 w/serving pieces, "Coquille" pattern, porcelain from the Couture Collection by Mikasa, \$35. Allen, 296-6453.

SKI BOOTS, ladies 6-6 1/2 Munari, \$45; dog house, med size, store bought, \$35. Lassiter, 299-1492.

TABLE for elec. trains w/HO track, 4' x 8', \$25; child's Columbia bicycle, \$30. Sherman, 292-3297.

6' ARTIFICIAL Scotch pine Christmas tree, \$8; 19" Sears B&W port. TV, \$25; Smith-Corona port. elec. typewriter, \$25. Andrick, 298-6917.

NAVAJO rugs, personal collection of several different types (Two Gray Hills, Yeis, etc.) & sizes. McGee, 299-0661.

SCOTT 35R AM/FM stereo receiver, \$75. Padilla, 296-7471.

TWO pr. Junior skis w/bindings, \$40 ea.; Jr. ski boots, size 6, \$10; Yamaha flute & case, \$150; guitar w/case, 3/4 size, \$25. Wickesberg, 294-8334.

OUTERS, mini grand target trap, plus 1 box clay targets, \$35; trailer, comb. utility & motorcycle, \$350. Wright, 296-3850.

2 TABLE lamps, 40"H, amber lower globe, \$25 ea. Chorley, 296-1454.

TV, 12" B&W, \$25. Maloney, 821-6661.

TURNTABLE, AR model XA. Drotning, 294-4807.

YELLOW armchair, \$35; 2 bar stools, \$30; beige drapes, 96" x 84", \$20; 2 tires, 175/70 SR 13 for

Scirocco, \$20 ea. Johnston, 821-1275.

ROLL-A-WAY folding twin bed, \$40. Zirzow, 294-7296.

TRUMPET, student, Reynolds, w/case, used 1 yr., \$250. Chinn, 296-5172 after 5.

COUCH & matching chair, recently upholstered, \$75. Barton, 268-7349.

LOBO basketball tickets (2 seats) at or below cost. Cooper, 884-1363.

ANTIQUA cherry, formal dining set: table, chairs, buffet, \$750. Naru, 821-5712.

4 MAZDA 13x6 alum. mag wheels, \$100; '69 VW trailer hitch, \$12. Johnson, 255-5427.

KLIPSHORN, full size, corner, light oak finish, \$150; VIC-20 computer, cassette dirve, books, etc., \$100. Jeske, 299-2810.

TWO matched, old & unusual concho belts; valued at \$900 ea., sell both for \$1600. Diggs, 293-5343.

STEREO, AM/FM radio, 8-track tape player, cassette player/recorder. Widenhoefer, 298-2510.

CAR-TOP locking ski rack, \$40; new 215cm Fischer cross-country skis w/bindings, Glass-SL, \$90; Europa-99, \$95. Klett, 884-8354.

DISHWASHER, Sears best under-counter, maintained under service contract, \$100; slate pool table, \$100; Hercules sleeper couches, pair \$100. Atkins, 298-5762.

NEW KitchenAid food processor, attachments, in box; Viking sewing machine, folding table, attachments, used 5 times, all less than 1/2 price. Kraft, 821-3435.

FIREPLACE screen, \$10; ladies 3-spd. bike. Peters, 293-6356.

SNOWTIRES, P195/75R14 or ER78-14 Firestone Town Country Sno-Biter, 4-ply radial w/studs legal in NM, 2 for \$30 ea. Stamm, 255-2640.

DOG HOUSE, medium size. Chirigos, 884-5686 after 5.

METAL wardrobe, walnut, 42" wide, \$65. Perea, 265-0861.

REFRIGERATOR w/top freezer & ice-maker, Sears copertone, 16 cu. ft., \$190. Linnerooth, 299-6558.

COLOR TV console, remote control, 21", Zenith, over 8 yrs. old, \$85. McIntire, 884-3709.

SKI RACK, trunk mounted, hold 4 pr., lockable, \$20. Luikens, 881-1382.

19" MAGNAVOX color TV, \$190; 19" RCA B/W TV, \$75. Duvall, 881-4406 after 5.

NATURAL gas space heater, \$25 OBO. Mozley, 884-3453.

CAMPER, 10', sleeps 6, needs work, \$600 or offer. Stixrud, 298-0478.

SCOTTY pups, AKC reg., black. Davis, 266-1657.

KITCHEN Set, seats 4, \$100; boys & girls bikes, \$25; belt sander, \$30; charcoal grill w/cart, \$20. Eckelmeyer, 296-2148.

TRANSPORTATION

79 KAWASAKI K2750, red, fairing, many extras, make offer. Harwood, 299-1326.

'73 FORD F-100 1/2 ton, white, 360 ci, V8, 4-spd., dual gas tanks, roll bar, front guard, spot light. Tranco, 897-1167.

'71 BMW R60/5, maintenance & improvement records, windjammer, chrome, \$1200/best reasonable offer. Kiekel, 296-3185.

'72 GMC/Mobile Traveler 11 1/2' camper, 34K miles, PS, PB, AT, AC, self-contained w/shower, stove/hr., dbl. sink, dual tanks, more, \$6K. Hughes, 299-6674.

'75 BRICKLIN SV-1, Gullwing sports car, PS, PDB, AC, AM-FM cassette, CPI \$11,500, sell for \$9400 OBO. Yarbery, 821-1002.

'78 HONDA Twinstar motorcycle, 185cc, 6K miles, needs valve work, \$600 w/work done, \$500 wo/work. Murray, 255-3421 after 5.

SNOWMOBILE, Yamaha, 14 hours, \$1200; teak roll-top desk, \$500; Remington 45 cal. Mod. 15A19, \$400. Hanks, 298-2454.

'72 VOLVO, rebuilt engine w/17K miles, std. 4-dr., \$1950. Zutavern, 298-6523.

'74 BLAZER, 4-wd., AT, PS, PB, AC, Cheyenne pkg., best offer. Carli, 298-9271.

'73 DATSUN 240Z, 4-spd., AC, bra. louvers, Alpine stereo AM-FM cassette, Goodyear T/A radials, \$4K OBO. Longfellow, 299-7062.

'75 HONDA Civic, 4-spd., new paint, \$1500. Pyo, 822-9056.

'77 DODGE Van, V8, AT, PS, PB, CC, new tires, metallic blue, 9-pass., \$3700 OBO. Rutledge, 821-3048.

'74 CHEVROLET Malibu stn. wgn., one owner, 350 engine, new tires, \$1300 OBO. Boen, 299-4085 after 4.

'82 PICKUP, 4x4, extras; '63 VW, new paint, overhauled engine, new throwout bearing, extras, HD bumper. Sena, 345-0466.

'79 DATSUN 280ZX, AT, AC, AM-FM, 64K miles, \$8400. Smith, 281-2940 after 5.

'77 DATSUN 280Z, 63K miles, 4-spd., AC, AM-FM cassette, \$5500. Reed, 884-4505.

'75 VW van, 7-pass., \$2K. Barrows, 296-9775.

'80 SILVER Datsun, 5-spd., AC, low miles, \$3700. Boehme, 293-1087.

'73 FORD pckup, 3/4 ton, Camper Special, PS, PB, AC, 4-spd., \$2K OBO. Workhoven, 281-3246.

'63 LINCOLN Continental, 4-dr. convert., AM/FM radio w/tape deck, CPI book value \$8500, sell for \$6500. Strascina, 299-2285.

'79 DODGE D-50 sport pickup, camper shell, AT, CC, AC, AM-FM-cassette, \$3500. Schwoebel, 298-4295.

'68 CHRYSLER Newport, 4-dr., low miles, one owner. Hollowwa, 255-6938.

'78 CHEROKEE 4-wd, 2-dr., 360 CID, \$3500 or best reasonable offer. Wright, 296-7670.

'81 HONDA Accord, 4-dr. sedan, 5-spd., AC, PS, Pioneer / Jensen AM-FM-cass., 36K miles, below NADA, \$6500. Dippold, 821-5750.

BICYCLE, 10-spd., 26" wheels, 21" frame, \$45. McKiernan, 255-2277.

'78 FORD T-Bird, AT, PS, AC, AM/FM w/tape deck, CC, 58K miles, \$3200. Hutchins, 884-6076.

'68 COUGAR XR7 G.T., 390V8, AT, PS, AC, tilt wheel, factory service manual, \$1900 OBO. Zirzow, 294-7296.

MAN'S 10-spd. bicycle, \$75; wine set: decanter & 6 glasses, \$20. Beasley, 298-3398.

'83 HONDA CR-80-R, water-cooled, Pro-link rear suspension, never raced, \$500; Schwinn World 10-spd. bike, \$75. Page, 821-2310.

'73 PONTIAC, 9-pass. Grand Safari wgn., AC, radials, cruise, tilt, elec.

windows, seat, doors, AM/FM 8-track, \$950. Sublett, 884-4426, 884-4654.

'74 CHEVELLE Laguna, 72K miles, 400V8, loaded w/options, \$1700. Peters, 293-6356.

HONDA cycle, many new parts, \$450 or offer. Atkins, 298-5762.

'67 MGB, white, under 20K miles on rebuilt motor, steel band radials, new clutch, \$1500 negotiable. Stixrud, 298-0478.

REAL ESTATE

CEDAR CREST, 2 acres bordering National Forest, underground utilities, good solar site, \$38K, 5% down, \$485.46/mo. Levin, 345-9246.

2-BDR., 2 bath, '73 Schulte MH, covered porch, washer, dryer, refrig., stove, mini-blinds, covered carport, Meadows, \$17,800. Kolestar, 821-1991.

RIO RANCHO, 2 bdrs., 1 bath, 2-car garage, front landscaping, stove, refrig., drapes, \$46,500. Serrano, 892-8185 after 5.

MOUNTAIN CABIN, 2-bdr., 1/4 acre, at Brazos (near Chama), \$38K, down plus 4-yr. 9% note (1 payment in 4 yrs.). Hanks, 298-2454.

3-BDR., 2 bath, dbl. garage, 1517 sq. ft., Rio Rancho, many extras, \$69,900. O'Neil, 892-6754.

3-BDR. on 1/3 acre, 1 3/4 bath, insulated, dbl.-paned windows, Los Lunas area. Shannon, 865-0287.

COLORADO Chalet, 30 mins from Denver, fp, skylights, decks, loft, appliances, garage, shed, acre, assumable 11 1/2% FHA, \$96K. Carter, 881-1568.

'71 CRAFTSLINE MH, 14' x 64', 2-bdr., 2 bath, in park, \$8K. Lujan, 836-3447.

CEDAR CREST, wooded 2.2 acres, Ponderosa Ranch Estates. Mora, 821-6759 after 6.

4-BDR., remodeled, den w/fp, rec. room w/wet bar, LR, DR, sprinklers, garden area, 2135 sq. ft., \$77,500. Stablein, 299-7919.

WANTED

BABYSITTER, mature adult for occasional babysitting in Four Hills area. Belding, 294-7443.

USED dresses, girl's 0-6 months, reasonable price. Vonderheide, 842-9568.

EXPERIENCED keyboard player for R&R band. Jackson, 897-4258 after 6.

MOVING space for small misc. tools, chairs, clothing to York or Manheim, Penn. Harris, 255-6577.

ALUM. extension ladder, 26' or 28' long, in good condition, reasonable. Rodriguez, 296-3277.

'73 FORD stn. wgn. body. Pitcher, 292-4091.

CAGE for small animal (gerbil or hamster). Locke, 299-1873.

SKI equipment for girl size 12, shoe size 6 1/2. Jojola, 294-7354.

NEED child care for 5-mo.-old infant in your home. Mon.-Fri., NE heights or Base. Dutler, 822-8285.

SHARE-A-RIDE

SHARE ride to Binghamton, NY, area or en route. Leave Albq. Dec. 15; return Jan. 6. Kiekel, 296-3185.

Christmas Party Tonight

TONIGHT, Club members celebrate. This is the first big party of the holiday season and it starts right after work. Singer Robin Arquette entertains from 5 to 8, dining room hours are from 6 to 9, and the band plays for dancing from 8 to 12. Dinner is a two-for-one special — filet mignon for two for \$10.95. The band is the Amigas, a great group playing a variety of tunes in a danceable style. Call the Club office, 265-6791, about reservations *right now*.

A TRAVEL PROGRAM on Spain and Portugal is scheduled in the Club ballroom on Tuesday, Dec. 11, at 7:30 p.m. Everyone is invited. Travel committee chairman Marv Plugge (5171) has information on a number of available trips scheduled by local travel agencies. Included are packages for cruising to Alaska and another on a Mississippi riverboat. Stop by the club office for literature on these and other trips.

ANNUAL SNOBALL of the Coronado Ski Club is set for Friday, Dec. 14, from 9 until 1 a.m. The WDC Band plays for dancing. There will be munchies and goodies, the usual low CSC prices, and the famous door prizes. A new wrinkle for this year's ball is a costume contest for the Abominable Snowperson. First place winner in this contest receives his/her choice of a season pass to Rio Costilla or some topnotch ski merchandise. Second and third prizes will also be awarded. Tickets may be ordered from Sadie Hesselden (7540). Prices are \$4.50 in advance, or \$5 at the door.

ON FRIDAY, Dec. 21, right after work when the 11-day holiday break starts, start it at the Club. There'll be a spread of hors d'oeuvres, Robin Arquette entertaining, good cheer, and much well-wishing for a happy holiday.

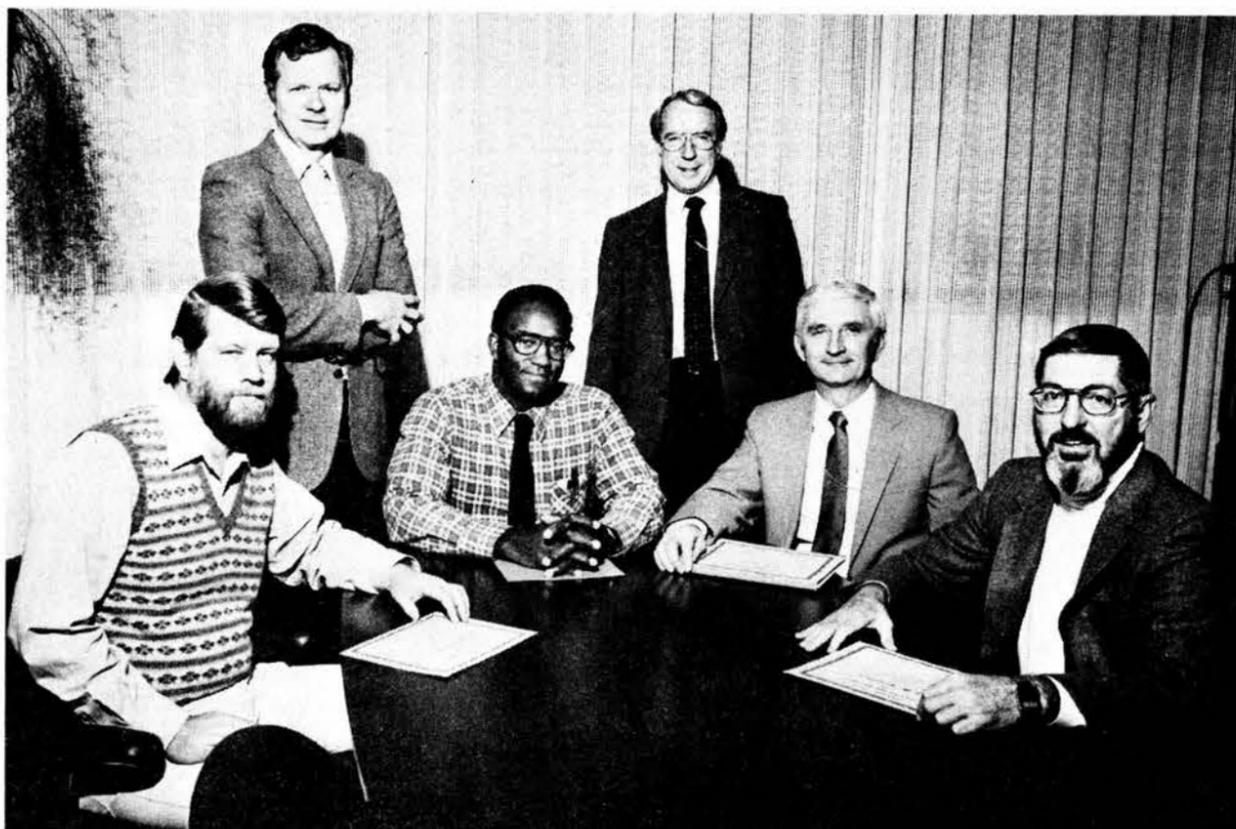
NOW IS THE TIME to make reservations for the Club's New Year's Eve celebration. Spinning Wheel plays upstairs, Linda Cotton downstairs — a couple of fine entertaining groups. Hats, horns, favors, and noisemakers are part of the package for ringing in 1985. Breakfast is served at 12:30 a.m. Call the Club office, 265-6791, right away. The price is \$16 for member couples, \$20 for guest couples, and includes a bottle of bubbly.

RETIREEES got organized at a recent meeting and elected temporary officers for a new special interest group of the Coronado Club. Nick DeLollis is president; Lou Stam, vice president; Fran Schroer, secretary; and Pat Liguori, treasurer.

All Sandia and DOE retirees, their spouses, widows and widowers are eligible for membership. In addition to Coronado Club membership, annual dues are \$5 per person.

The organization will arrange special travel discounts and plan RV excursions, dances, dinners, and other activities for retirees.

Next meeting of the group is scheduled Monday, Jan. 7, at 2 p.m. at the Club.



"OUTSTANDING CONTRIBUTIONS" to Sandia's computer security program led to special recognition for Dave Baldwin (7613), left, George Urish (7612), second from right, Tom Schultheis (also 7613), right and Doug Brown (2645), not shown. Craig Jones (2610; seated second from left), SNLA Computer Security Officer, and Arlin Cooper (standing, left), supervisor of Computer Security Division 2612, presented the awards. Don Doak (standing, center), manages the Computer-Aided Design and Integration Department 7610, home to three of the award winners.

Four Sandians Honored for Work in Computer Security

Computer security is one of those topics that too often make the news only when it's failed — kids who tap into a data bank, adults who manipulate bank computer systems to their own benefit, etc.

But this story deals with four Sandians who have taken their responsibilities as ACSOs (assistant computer security officers) most seriously. Each one was recently honored for outstanding achievement in the computer security field.

George Urish (7612) was recognized for his success at file monitoring, the difficult task associated with ensuring that computer resources are used only for official purposes.

Dave Baldwin (7613) was honored for his work in structuring a new format for security plans for complex networks of computers, a format that is now being adopted throughout the DOE complex.

Tom Schultheis' (also 7613) achievements reflect his work in both intra- and intersite communications; among other accomplishments, he has developed innovative interconnection techniques that promote computer network security.

Doug Brown (2644) specializes in the VAX computer systems common at Sandia. A users' group, which he chairs, pioneered several dramatic advances in the security of VAX operating systems, advances that gave him nationwide recognition in the field and led to VAX program modifications that make all VAX systems much more secure than earlier models were.

Craig Jones (2610) SNLA Computer Security Officer, said, "I appreciate the work of all Sandia's ACSOs, and I would like their management to recognize it also. They perform this important task in addition to their other mainstream assignments.

"But these four have achieved wide-

spread recognition for their computer security accomplishments. They have earned the special attention we are giving today."

Craig went on to note, "We manage the computer security program in 2610, but responsibility for execution remains with the organizations and individuals using the machines. The 'bottom line' in the security business is, and always will be, the integrity and trustworthiness of each member of the staff."

Welcome

Albuquerque

Robert Caldwell (1141)
Thomas Calocci (2321)
Cynthia Jiron (154)
Tom Thornhill (1233)
Ginger Wilkinson (6431)

Illinois

Herbert Tardy (1824)

Mississippi

Jay Jordan (5343)

New Mexico

Cynthia McCarroll (2141)
Benny Montoya (3611)
Ricky Pierson (3613)

Pennsylvania

Gordon Iben (2149)

Utah

James George (5215)

Texas

James Walkup (322)

True? We Refuse to Comment



Silence as a policy has become impossible in modern society, for the vacuum created by failure to communicate will quickly be filled with rumor, misrepresentation, drive, and poison.

— Northcote Parkinson